ENGINEERING NEWS-RECORD

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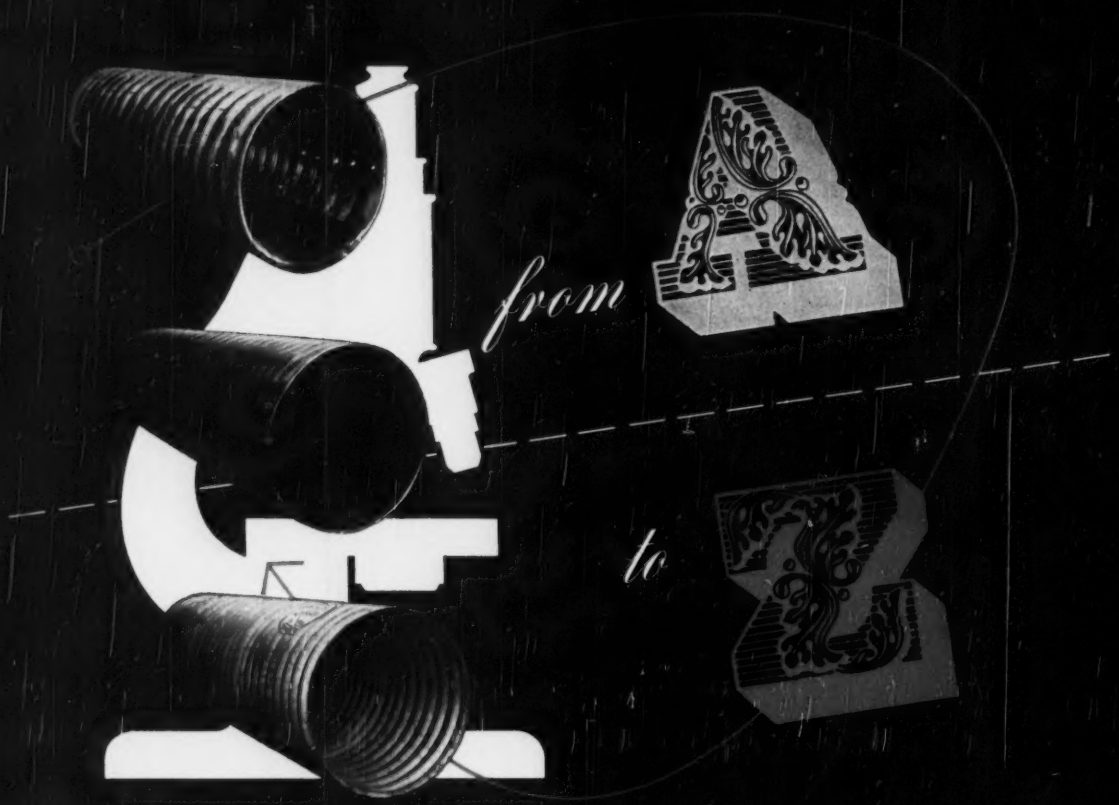

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Creating better products to meet specific needs has been the objective at Armco for more than 40 years. A few examples are HEL-COR Perforated Pipe, STEELOX Buildings, FLEX-BEAM Guardrail, PIPE-ARCH and sturdy, MULTI-PLATE Bridges.

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B.F. Goodrich

The tire that thrives on a diet of mud and razor-sharp rocks

TIRES hauling ore-bearing clay from pit to mill in barite mining service lead a difficult life. The tires on the equipment shown being examined above, operated by the Baroid Sales Division of the National Lead Company, Potosi, Mo., have been working under the following routine:

One minute they are backing out on raw clay in the pits — a clay that has the consistency of putty when moist, but like rough stone when dry. Next, they are carrying a twelve-ton load to the mill over a road of flint and quartz — a surface similar to broken razor blades.

Yet, the operators report they have experienced *no road delays due to tire trouble* since B. F. Goodrich tires were put into service in 1947. This big cut in operating costs is largely due to the exclusive protection of the patented *nylon shock shield* found only in B. F. Goodrich tires (with *double* nylon shock shield in larger sizes). Layers of nylon cord, built between the tread and body plies, shield the cord body by smoothly distributing shocks and strains.

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Regardless of the type of tire service your equipment demands, your B. F. Goodrich retailer has a cost-cutting answer. See him and be sure to specify BFG tires for your new equipment. Enjoy the extra savings of patented nylon shock shield protection at no extra cost. *The B.F.Goodrich Company, Akron, Ohio.*

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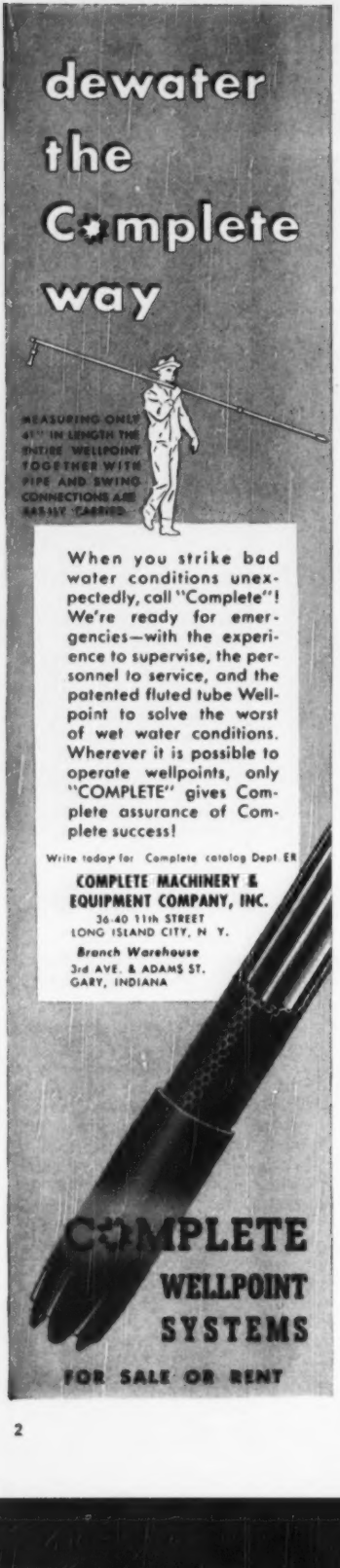
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ENGINEERING NEWS-RECORD

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Volume 145 DECEMBER 7, 1950 No. 23

WALDO G. BOWMAN
Editor

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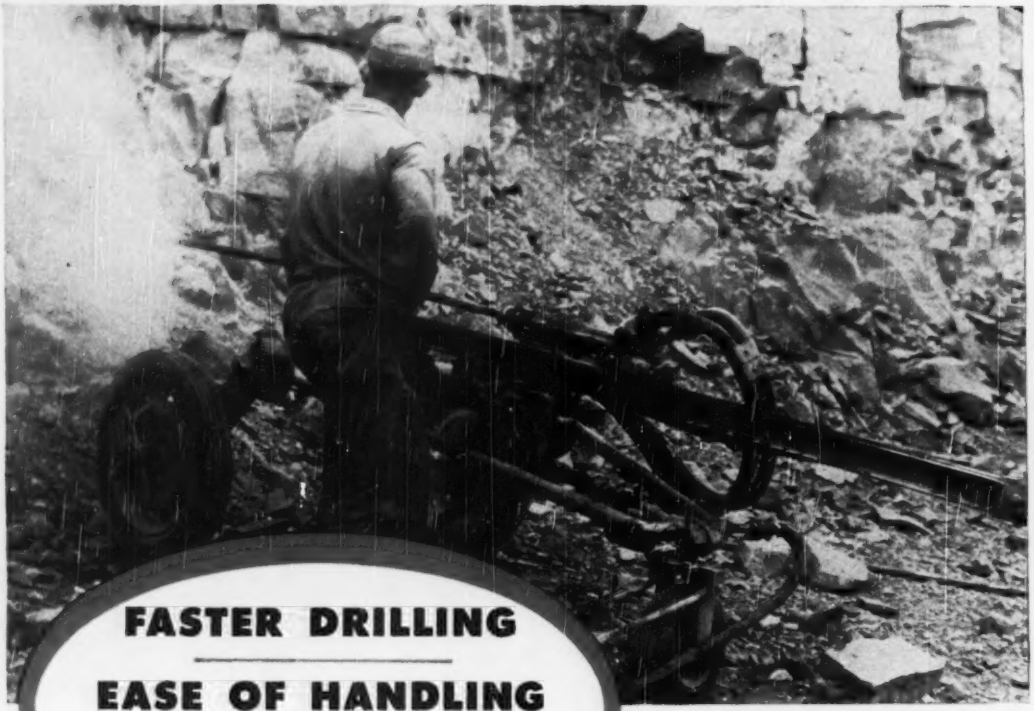

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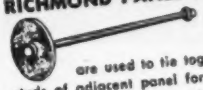
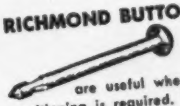
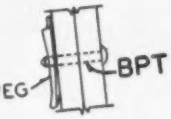


are used to tie together the end-studs of adjacent panel forms. There is a head washer at each end, with a large loose-fitting washer at one end. The Ty-holder engages at the other.

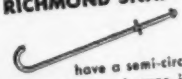
RICHMOND BUTTON HEAD PANEL-TYS



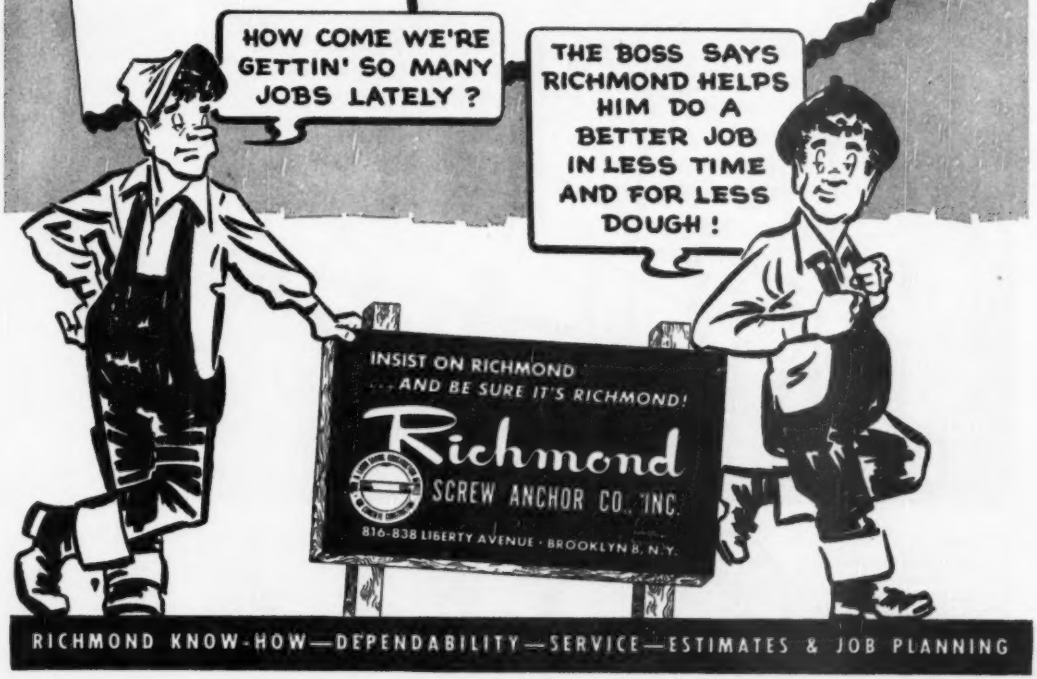
are useful when the most exact positioning is required. The design eliminates side slippage. The end is notched for the Tyholder. Also useful for tieing in ledgers.



RICHMOND SNAP-TYS ANCHORS



have a semi-circular hook providing positive anchorage in concrete. These are 1" break back type with a flat guide washer to gauge correct position for anchoring sill blocks for construction bracing.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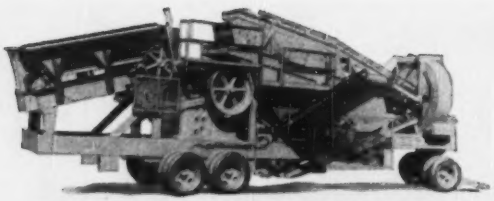

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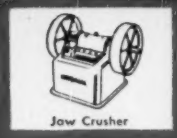
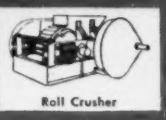
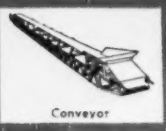


Jaw Crusher



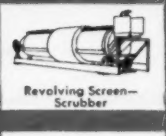
Roll Crusher

Hammermill

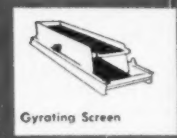


Conveyor

Apron Feeder



Revolving Screen—Scrubber



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NEWS BRIEFS

Cooperative power project—Quebec's first cooperative hydro-electric unit was opened recently in one of the more isolated sections of the province. It is in Chicoutimi County and serves the parishes of Petit Saguenay and Anse St. Jean. It generates only 300 hp. Transmission and distribution lines total 41 miles and serve 235 users. Members subscribed $28,000, and $137,000 was granted by the Provincial Rural Electrification office.

Merrimack flood control—The New Hampshire 1951 legislature will be asked to approve a pending interstate compact with Massachusetts to provide for flood control for the Merrimack River from Concord, N. H., to Newburyport, Mass. The New Hampshire Council on Resources and Development, representing five state departments dealing with natural resources, says that it would urge approval of the compact which would give the federal government authority to spend an estimated $25,000,000 for big dams at Hopkinton and Loudon in New Hampshire.

Contract lost by 48 cents—A difference of only 48 cents determined recently which of two Atlanta, Ga., firms was the apparent low bidder on a $128,000 government contract. Tri-State Construction Co. bid $128,568 to repair buildings at Camp Gordon, Augusta. The runner-up among nine bidders offered to do the work for $128,568.40.

No "Miracle Mile" for Edmonton—Taxpayers of Edmonton, Ala., have voted "no" on a $25,000,000 scheme for a streamlined civic center for Canada's northernmost metropolis. A group of New York backers would have financed a project to transform a 4-block undeveloped area in the heart of the city. There would have been a large auditorium, office buildings and parking space for 1,800 cars, but the vote was 6 percent below what was needed for approval of the ambitious plan.

Too much man-made rain—Farmers in the vicinity of Pasco, Wash., have threatened court action against an artificial rain-making concern they accuse of destroying most of their seed crop. The Big Bend Water Development Association, they charge, caused an unseasonal three inches of rainfall instead of the normal one inch. The seed crop lost, seed companies have refused contracts to the farmers for the coming year. The farmers are

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From Old Saint "Vic" with lots of good cheer
His Victaulic joints are strong and tight
He's ready to serve you with piping that's right
For leak-proof Couplings, Elbows and Tees
"Victaulic's" the word when you want all of these
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26TH VICTAULIC YEAR

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The easiest way to make ends meet
VICTAULIC
PIPE COUPLINGS AND FITTINGS

willing to settle out of court if assurance is given that the rain-makers will confine their efforts to certain designated periods.

A godsend for builders—A novel time and trouble-saving idea for customers has been adopted by the Forest City Material Co., Cleveland, Ohio. Giant display boards are installed in the company's stores from which one can select anything needed in an instant. The company has brought its yard and mill items right into its stores for customers' inspection and selection. On the boards are mounted one each samples of every dimension and grade of bumper, wallboards, paneling, roofing, shelving and siding. Current prices are displayed alongside the samples.

Reducing industrial pollution—A program of controlling industrial waste pollution of streams has been activated at the Buick plant in Flint, Mich.

The sulphuric acid wastes have been cut by nine-tenths through recent installation of a shot blasting machine in the forge plant. The machine replaces a previous method of cleaning forgings in sulphuric baths. By 1953, Buick hopes to discontinue altogether the use of acid in cleaning. The long range program calls for elimination of pollution of all types in the Flint River that flows past the plant.

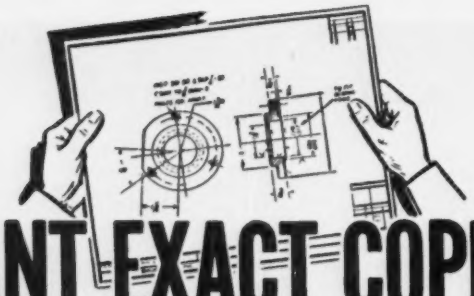
Buick's large new plant now under construction will be furnished with the latest equipment to keep pollution that must enter the river at a minimum.

THE COVER

Piano-playing on duty time is a most unusual occupation for W. W. DeBerard, Chicago's City Engineer. But this time he can be excused—the occasion was his 75th birthday and marked 10 years at his present complex post. And the piano was a gift from fellow workers.

DeBerard's long career started with his graduation from M.I.T. (with a sanitary engineering degree) in 1901; included nine years as a consulting and designing engineer. In 1910 he joined the staff of Engineering Record as western editor at Chicago, continuing with that journal and its successor, Engineering News Record, for 31 years, until he became Chicago's city engineer.

Hale, hearty, keenly aware of the problems of the great city for whose welfare he is largely responsible, "Deb" heads up the Bureau of Engineering with 3,000 employees and an annual budget of more than $28,000,000.



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16" and UP

If your requirements call for transmission or distribution mains of 16" diameter or larger, Lock Joint Pipe Company can provide high quality concrete pressure pipe in all standard diameters and some intermediate sizes. Starting at a minimum of 16", Lock Joint Concrete Pressure Pipe is produced in 32 different diameters, and its four distinct types of structural design cover every working condition common to American water works practice.

Not only does Lock Joint Concrete Pressure Pipe qualify fully under A.W.W.A. specifications, but it alone embodies, in a conventionally designed pipe priced to meet competition, all the nine time-tested characteristics listed at right:

- **PERMANENT HIGH CARRYING CAPACITY**
- **PROOF AGAINST TUBERCULATION, CORROSION AND ELECTROLYTIC DAMAGE**
- **IMMUNITY TO RUPTURE OR BLOW-OUT**
- **SAFETY UNDER EXTREME EXTERNAL LOADS**
- **EVERY JOINT FLEXIBLE AND WATERTIGHT**
- **EASILY TAPPED**
- **SPECIALS TO MEET INDIVIDUAL SPECIFICATIONS**
- **USEFUL LIFE CONSERVATIVELY ESTIMATED AT 100 YEARS**
- **MINIMUM MAINTENANCE AND REPAIR COSTS**

Whether your proposed line is large or small it will pay you to use Lock Joint Concrete Pressure Pipe, the pipe of proven durability, economy and dependability.

SCOPE OF SERVICES—Lock Joint Pipe Company specializes in the manufacture and installation of Reinforced Concrete Pressure Pipe for Water Supply and Distribution Mains in a wide range of diameters as well as Concrete Pipes of all types for Sanitary Sewers, Storm Drains, Culverts and Subaqueous Lines.

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BRANCH OFFICES: Casper, Wyo. • Cheyenne, Wyo. • Denver, Col. Kansas City, Mo. • Valley Park, Mo. • Chicago, Ill. • Rock Island, Ill. Wichita, Kan. • Kenilworth, N. J. • Hartford, Conn. • Tucumcari, N. Mex. Oklahoma City, Okla. • Tulsa, Okla.

LOCK JOINT
Reinforced Concrete
PRESSURE PIPE

"MORE POWER, WEIGHT *and* SPEED

makes these TD-24's do more work than any other tractor on this job," says contractor R. K. Nickols

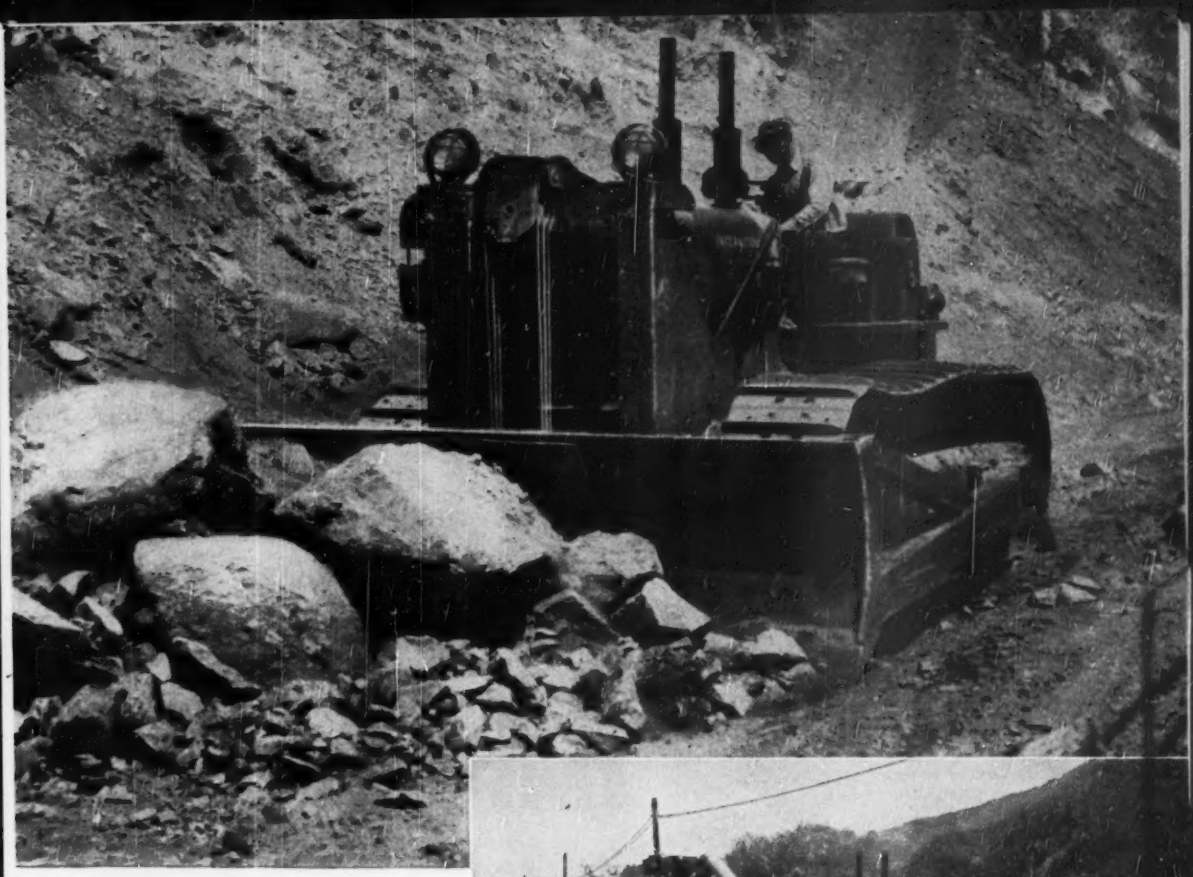
Taking the twists out of Carmel Valley road involves moving 340,000 cubic yards of rugged California terrain. Both Mehren Construction Co. and Los Gattos Construction Co. chose International TD-24's for bulldozing and push-loading here.

R. K. Nickols, contractor, says, "We really get good service from these tractors. They are faster at push-loading our scoops. They have more power, weight and speed and do more work than any other tractors on this job. When push-loaded by TD-24's, scrapers get 15% to 20% more loads on the fill in a day."

And so the story goes from coast to coast, wherever construction and earthmoving jobs are too tough for ordinary tractors, contractors call on the TD-24. These "Champions" dig in and deliver payloads where other tractors have trouble in traveling.

It will pay you to find out what's in the TD-24 for you. Drop in at your nearby International Industrial Power Distributor's place of business and let him show you the reasons why the International TD-24 is known across the nation as the "Champion of Crawlers."

INTERNATIONAL HARVESTER COMPANY, Chicago



'Dozing rocky obstacles out of the way on this California mountainside demands TD-24 power.

Push-loading scrapers is faster, more profitable when you have the power, weight and speed of the TD-24 on the job.

INTERNATIONAL HARVESTER

INTERNATIONAL
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A NEW, MORE POWERFUL SIZE 504 AIR IMPACTOOL!

Rated for nut running up to ⅜" bolt size

- **20% increase in impacting torque** makes **easier** and **faster** work of the toughest nut running jobs.
- **65% increase in the free speed** of the new 504 Impactool cuts run-down time and lowers assembly costs.
- **Quiet operation has been achieved** in redesigning this popular air-powered Impactool. Scientifically designed muffling has reduced the noise level of the new Impactool twenty points on the decibel scale as compared to the previous model. This means that 100 **new** 504 Impactools would have to be operated to sound as loud as one old model 504! Think what this feature alone means in reduced operator fatigue, increased safety and higher worker morale!
- **Worker acceptance is assured** because the tool is perfectly balanced and has a palm-fitting handle grip with thumb groove for the best in ease of handling. The large, deep-grooved reverse cap makes it easy to reverse the tool even with greasy hands. It's streamlined appearance with polished casing and maroon reverse cap make the new 504 stand out in any shop.
- **12% increase in gear life** is obtained by the use of larger, more rugged gearing.
- **20% longer service life** of the tool has been achieved through the installation of an air strainer in the grip handle. The strainer keeps rust, scale and dirt in the air line out of the motor, preventing scoring or undue wear.
- Call, wire or write your Ingersoll-Rand branch office today and arrange for a convincing trial of this quiet labor-aiding, time-saving Impactool in your plant, on your jobs.

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In addition to its use as a nut runner, the 504 Impactool may also be used to perform many other jobs. Thousands of powerful rotary impacts make the toughest jobs easy!

Capacities

Drilling	⅜"	Broken Cap Screw and Stud Removal	⅜"
Step Drilling to	¾"	Driving and Removing Studs	⅜"
Reaming	⅝"	Wire Brushing	⅜" shank
Tapping	⅝"	Masonry Drilling	⅝"
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Hole Sawing	2"		

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Operators Know . . . the

LULL Shoveloader is SAFER TO OPERATE

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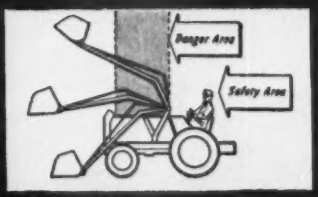
from MOVING PARTS and FALLING ROCKS



WOULD YOU like to operate a loader which required you to sit directly between the working lift arms? Of course not! Neither would operators. They too know the danger of falling boulders and moving arms.

● SIT IN SAFETY in the LULL SHOVELOADER . . . designed for maximum operator safety.

OPERATORS KNOW their position on a loader is important to their safety. On a LULL SHOVELOADER, they know they are well clear of moving arms and falling rocks. They know they have full freedom of movement without fear of the giant they operate.

OPERATORS ARE CONFIDENT in the SHOVELOADER'S safe, versatile operation. They like its safer lifting, loading, scraping, bulldozing, digging and transporting. Accidents cost man hours, law suits, and increase insurance rates. Get the facts about LULL SHOVELOADER'S safety today!

THE LULL LOG LIFTING FORK, like all other LULL attachments, has the same LULL safety design as the SHOVELOADER. Even with the high lift of the lifting fork, the operator is well clear of falling logs and moving arms. Log stacking can be dangerous but not with a LULL LOG LIFTING FORK.

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Signal of Security

Though tiny in terms of illuminating power, the glimmer of a Christmas Candle is in many ways the most piercing light in the world. For to those who would alter the meaning of American freedom, this glowing flame stands as a symbol of renewed faith in our Creator and in our inalienable rights to life, liberty and the pursuit of happiness.

Again this year it is our sincerest wish that the warming glow of the Christmas Spirit will burn brightly for you and yours. And we join with you in joy and thankfulness for our many blessings in this great land of ours.

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JOSEPH T. RYERSON & SON, INC. STEEL-SERVICE PLANTS AT: NEW YORK • BOSTON • DETROIT

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THE CONSTRUCTION WEEK

GO AHEAD ANYWAY—Despite the continued refusal of the Ohio State Auditor to pay the bills, the state has asked two consulting engineering firms (Parsons, Brinckerhoff, Hall and Macdonald of New York and J. E. Greiner Co., Baltimore) to continue their surveys for the proposed $300 million Ohio Turnpike. The auditor, Joseph T. Ferguson said he wanted to test constitutionality of the turnpike act, despite opinions from the state's attorney general that the act is constitutional and the payments legal. The matter is now before state courts and Ferguson is credited with delaying the job as much as 18 months. (Ferguson enjoyed nationwide attention in the recent elections when, backed by labor, he opposed Senator Taft unsuccessfully. His Ohio-Turnpike stand is felt to have contributed to his defeat.)

MISSOURI PIKE?—Looking at the plans of neighboring states, Missouri will try to get back on the toll-turnpike bandwagon when its legislature meets in January. State Senator D. W. Gilmore of Benton said he will present legislation to create a turnpike authority that would build a toll highway (a 4-lane, high speed road to cost between $130 and $160 million) between St. Louis and Kansas City. The proposal was presented to Missouri legislators once before—in 1949—but wasn't considered because it was presented too late in the session.

TRANS-CANADA ROAD KEEPS ON—Recent announcement that Canada will cut deeply into its public works program won't affect work on the long-dreamed-of project of paving the Trans-Canada highway from the East to the West coasts. The federal cabinet made it plain that it considers the road paving job essential to national defense. Meanwhile, though progress this year has been slow, engineers for the Resources Ministry said they expect the road (much of which will include widened and straightened existing highways) to be completed within the five-year period planned. Of the $300 million total outlay planned, only $20,000,000 is under contract at the moment—mostly grading and some construction.

NEXT STOP: COURTS—New York City's Corporation Counsel (acting for the Board of Water Supply) is preparing a petition to the Supreme Court of the United States for more water from the Delaware River. Stage 3—a reservoir near Cannonsville, N. Y., to divert 285 mgd from the Delaware watershed through a 44-mi tunnel—got New York State approval recently. But a high court ruling must now be obtained, since interstate waters are involved. In 1931, the Supreme Court decreed New York could take only 440 mgd—and that much will be diverted when Stage 1 & 2 projects are completed in 1955. But the Court's decree left a loophole: It said further action for relief could be applied for, and the Court would retain jurisdiction over any supplemental decree deemed proper. Question now is whether three Delaware-watershed states, New Jersey, Pennsylvania or Delaware, will try to plug the loophole.

HELP OFFERED—Seeking means of helping the Navy's Bureau of Yards and Docks, five ASCE officers held exploratory sessions with Rear Admiral J. F. Jelley at Washington. Representing ASCE were: President Howard, Past President Dougherty, President-Elect Hathaway, past vice-president Proctor, Secretary Carey. Further meetings will be scheduled.

INSURANCE—Determined to assure itself of supplies for the manufacture of cement, North Carolina has already placed more than 2,000 acres of land under mineral-rights lease, and will lease more. The program is a follow up on action of the 1949 legislature, which authorized erection of a cement plant in the state, if deemed feasible. A special commission has been studying the situation for some months.

TEMPORARIES OUT?—The so-called temporary buildings that burgeoned in Washington's parks and open spaces during both world wars would finally be knocked down and carted away, under recommendations of the National Capital Park and Planning Commission, presented to Congress a week ago. It's a good idea, anyway.

SUPPLY PROBLEM—With an eye on the rapid growth of areas east of Lake Washington, Seattle began considering plans for supplying the region with water. (The city has long supplied water to organized districts to the north and south). Water Superintendent Roy W. Morse suggested two new sources, should the city decide to go ahead with a cross-lake supply: The Tolt River, and either North or Middle forks of the Snoqualmie. The two could supply an additional 2,000,000 persons, he estimated.

ESCALATORS OUT—Canadian government sources cautioned prospective bidders on defense materials and construction that it wants firm bids. "Bidders who seek contracts on escalator clauses," said a spokesman, "will be placed in an unfortunate position."

NO HELP—A three-inch rainfall Nov. 25 failed to remove any of five Massachusetts communities from the critical list, in regard to water supplies. Worcester, Mansfield, Fall River, Danvers and Fitchburg, said the State Department of Public Health, are still in an official state of emergency, and water conservation measures are still in force.

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Standouts in any Plan

AN OIL REFINERY IN TEXAS needs cooling water chlorination.

A PAPER MILL IN WISCONSIN requires white water slime control.

A SWIMMING POOL IN CALIFORNIA wants chlorination to guard against water-borne disease.

A SEWAGE PLANT IN INDIANA needs chlorination for disinfection.

A CAMP IN VERMONT wants to sterilize its well supply.

A POWER STATION IN FLORIDA asks for chlorination to improve heat transfer in condensers.

Whenever and wherever the plans call for chlorination, Wallace & Tiernan Equipment stands out as the first choice of engineers and architects all over the country.

The reasons for this preference aren't hard to find because smart buyers know that with Wallace & Tiernan Equipment they get:

WIDE SELECTION—Wallace & Tiernan Chlorinators and Hypochlorinators come in a variety of models and sizes handling from ounces up to 3 tons of chlorine daily.

PROVEN EQUIPMENT—Manufactured in a modern, precision-conscious plant, every piece of Wallace & Tiernan equipment is thoroughly tested (before leaving the factory) for the actual job conditions under which it will operate.

EXPERT DESIGN—All Wallace & Tiernan equipment is the product of expert development by a top notch research group specializing in chlorine and chemical control equipment. This is the same group that has pioneered such famous developments as the Visible Vacuum Principle, Break-Point Chlorination, and Residual Recording during the last 35 years.

SERVICE—Wallace & Tiernan's nationwide service organization is ready to solve bacteria-induced water treatment problems, whatever they may be.

Call your nearest Wallace & Tiernan Representative for your next job involving chlorination. He will be glad to help you.

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CHLORINE AND CHEMICAL CONTROL EQUIPMENT
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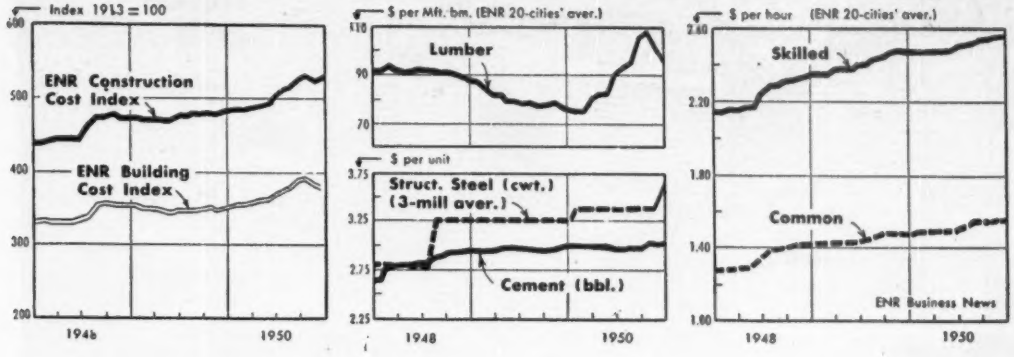
S-60

DECEMBER CONSTRUCTION BUSINESS REPORT



ENR INDEXES (1913 = 100)	Dec. '50	Nov. '50	% Change	Dec. '49	% Change
Construction Cost	528.73	527.85	+0.1	480.32	+ 10.
Building Cost	390.14	388.85	+0.3	353.21	+ 10.4
MATERIAL PRICES (20-cities' average)					
Cement, bulk, per bbl	3.089	3.059	+0.9	2.957	+ 4.4
Structural Steel, (3-mill aver.), per cwt	3.650	3.400	+7.3	3.250	+12.3
Sand, per ton	2.042	2.009	+1.6	1.965	+ 3.9
Lumber, 2x4 Fir, per M. ft. bm	102.897	108.897	−5.5	85.029	+21.0
Lumber, 2x4 Pine, M. ft. bm	90.150	94.666	−4.7	75.233	+19.8
Common brick, per M	29.850	29.575	+0.9	27.763	+ 7.5
Ready-mixed concrete, per c. y	10.697	10.600	+0.9	10.355	+ 3.3
Structural Clay Tile, 3x12x12 per M	135.248	135.248	0.0	131.755	+ 2.6
WAGE RATES (20-cities' average)					
Common	1.574	1.574	0.0	1.478	+ 6.4
Skilled (aver. 3 trades)	2.577	2.571	+0.2	2.464	+ 4.5
Bricklayers	2.838	2.838	0.0	2.721	+ 4.2
Structural Ironworkers	2.533	2.524	+0.3	2.432	+ 4.1
Carpenters	2.361	2.352	+0.3	2.242	+ 5.3

CONTRACTS AWARDED (thous.)	November 1950 (5-weeks)	November 1949 (4-weeks)	% Change†	Eleven Months 1950 (48-weeks)	Eleven Months 1949 (47-weeks)	% Change†
Total U. S. (ENR reported)	$1,012,046	$589,224	+ 37.4	$10,926,988	$7,293,842	+46.6
Private	518,944	312,227	+ 32.9	6,321,834	3,481,805	+77.7
Public	493,102	276,997	+ 42.4	4,605,154	3,812,037	+18.2
Federal	100,510	41,774	+ 92.4	1,112,805	929,670	+17.2
ENR Constr. Volume Index, '13 = 100	410	316	+ 29.7	480	340	+41.2
NEW CONSTRUCTION CAPITAL						
Total	787,065	304,787	+106.5	8,324,623	6,922,660	+17.7
State & Municipal Bond Sales	473,791	218,258	+ 73.6	2,833,716	2,728,198	+ 1.7
Corporate Security Sales	313,274	86,529	+189.6	2,139,813	2,061,238	+ 1.6
Federal (non-federal work)	.....	.....	.....	522,000	385,000	+35.6
Federal (federal work)	.....	.....	.....	2,829,094	1,748,224	+58.4

MATERIAL SHIPMENTS & LABOR SUPPLY	October (O) September (S) 1950	1949	% Change	Ten Months (10) Nine Months (9) 1950	1949	% Change
Cement, thous. bbls., Bu. of Mines	22,910(S)	22,763(S)	+ 0.6	171,353(9)	156,018(9)	+ 9.8
Fabr. Struc. Steel, thous. tons, AISC	168(O)	99(O)	+69.6	1,571(10)	1,600(10)	− 1.8
Lumber, mil. ft. bm., NLMA	3,637(S)	2,951(S)	+23.2	30,003(9)	22,884(9)	+31.1
Lumber Prod., mil. ft. bm., NLMA	3,717(S)	2,874(S)	+29.3	29,329(9)	23,294(9)	+25.9
Contract Constr. Employ., thous. BLS	2,595(O)	2,312(O)	+12.2	(Av.)2,269(10)	(Av.)2 154(10)	+ 5.0

† Computed on a weekly basis.

Vertical Assembly-Line Methods Mark Major Advance in Concreting Technique

● Mass production efficiency of the industrial assembly line has its counterpart in construction. Marble Hill Houses, latest in New York City Housing Authority's great project-a-month program, shows this principle at its finest and best—a vertical assembly-line spiralling 14 stories skyward.

Marble Hill consists of 11 identical 14-story buildings, 1,400,000 sq. ft. floor area. With 11 form sets, each used 14 times, CORBETTA CONSTRUCTION CO., INC. erected up to two stories per working day—*165 floors in 123 working days, averaging 1⅓ floors per working day.*

Time saved, four weeks per building—through sound planning and construction know-how, aided by always-dependable performance of 'Incor'*, America's FIRST high early strength Portland cement.

*Reg. U.S. Pat. Off.

Architect: **JOHN AMBROSE THOMPSON,** New York
Structural Engineer: **TUCKER & EIPEL,** New York
General Contractor for Superstructures: **CAULDWELL-WINGATE CO.,** New York
Concrete Construction by: **CORBETTA CONSTRUCTION CO., INC.,** New York
Ready-Mix 'Incor' Concrete: **COLONIAL SAND & STONE CO., INC.,** New York

LONE STAR CEMENTS COVER THE ENTIRE CONSTRUCTION FIELD

LONE STAR CEMENT CORPORATION

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LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 15 MODERN MILLS, 27,500,000 BARRELS ANNUAL CAPACITY

Diesel-Electric Tractor

THE CONSTRUCTION INDUSTRY should study LeTourneau's four-wheel drive, diesel-electric tractor with more than the normal interest accorded a new piece of construction equipment. Developed on the theory of applying driving power where it is needed the most, the Tournatow has a driving motor on each wheel (see p. 137). This eliminates clutch, transmission and differential in favor of delivering the power through wire cables from the tractor's diesel-electric generator direct to the four driving motors.

Although initially applied to a tractor, the motorized power wheel isn't limited solely to such prime movers. It can be extended to presently non-motorized equipment such as earth-carrying scrapers and elevating loaders either as additional primary power or secondary, booster-power. Accepting that possibility, it is not too bizarre to imagine future developments in heavy hauling equipment encompassing a train of vehicles, with each unit mounting motor-driven wheels energized by a common diesel-driven generator.

The mounting demands for ever-greater and more efficient production in earth-moving operations continue to challenge the equipment designer. In its motorized power wheel LeTourneau has introduced a principle that accords with this challenge. How it proves itself on the job will be a matter of wide concern in the construction industry.

Beyond the Long Island Wreck

DEVICES that automatically apply the brakes on a train that runs past a caution signal at higher than specified speed or that passes a red signal can prevent a repetition of the fatal accident of Nov. 23 on the Long Island Railroad. They will not, however, correct a condition that must share responsibility for this and similar accidents—lack of physical capacity to carry safely the number of passengers who need to be served at the hours of peak travel.

In that condition can be found at least a partial explanation of why the Long Island and other roads handling high density traffic have not installed the automatic controls that most people are demanding today. For while automatic devices will make the Long Island R. R. safer, they also will multiply the delays that for years have annoyed commuters and will reduce further the line's overtaxed capacity.

Every railroad operating man knows that the only way to minimize delays on such densely used rail lines is to permit enginemen to exercise their own judgment about reducing speed at a cautionary signal or coming to a dead stop at a stop signal. Time after time and day after day all that a yellow signal means is that the train ahead has not quite reached the far end of the second block beyond the signal; and all that a red signal indicates is that the train ahead has not quite cleared the block just beyond the signal. When trains run at scheduled speed on such close headway, a slow down of one train slows all trains behind it; if one stops all will soon be stopped. Then flagmen will have to be "whistled out" and later recalled, and thousands of complaining commuters will be tardy at the office or late for supper.

The only complete answer is more tracks and more terminal facilities. On roads like the Long Island the cost of providing them would of necessity send commuting fares skyrocketing.

These are the hard, cold facts that need to be faced by those who think that the troubles of the Long Island Railroad can be solved by a change in trustees or by a change in ownership and management. They will not be solved until the railroad has more tunnels under the river to New York, larger terminal facilities in New York, larger yards in Long Island City, more tracks reaching out into the major suburban communities and more loading and unloading facilities in those towns. What this would cost or what effect it would have on Long Island as a suburban area serving New York, one can only surmise. It will unquestionably add substantially to the cost of living near enough to New York City to work there.

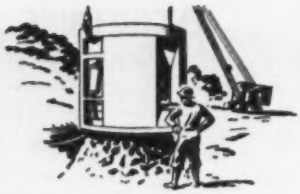
Educating Engineers

A FACULTY COMMITTEE at Massachusetts Institute of Technology has just come forward with a proposal that the school's program be planned principally for those who take only a four-year undergraduate course. (See p. 38).

In coming to this decision—as the result of a three-year study—the MIT staff is going against a trend that already has lengthened the undergraduate training period for engineers in some schools. And it does so while emphasizing that the four-year course be planned to recognize that "it is essential that the modern engineer be able to organize and direct men;" and that he be "a man of broad culture."

How this is to be achieved points up the dilemma that has plagued engineering educators for two decades. The MIT committee hopes to solve it by reducing the detailed content of courses in favor of more emphasis on fundamental principles and upon the development of powers of judgment and discernment; "Care should be taken not to load the student with so many obligations that he has no chance for reflection."

That is a large order. Other educators can be expected to follow with interest the plan that is developed at MIT to meet these objectives within the span of a four-year college course.



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Makes more durable concrete

The air-entrainment feature of Duraplastic minimizes water-gain and segregation. Finished concrete is thus fortified against damaging effects of freezing-thawing weather. (At right: Hydro-Electric Plant, Little Chute, Wis. Built for Utilities Commission of Knukauna, Wis., by contractor C. R. Meyer & Sons Co., Oshkosh, Wis. Consulting engineer: Holland, Ackerman & Holland, Chicago.)

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ENGINEERING NEWS-RECORD

DECEMBER 7, 1950 VOL. 145, NO. 23

AEC picks H-bomb plant site for $260-million project

Relocation of 1,500 families seen as AEC nods go-ahead on 250,000-acre site—New plant will need hydro-electric power to produce tritium, H-bomb white hope

Development of large-scale production facilities for hydrogen bomb materials is a foregone conclusion as a result of the selection of a site for another atomic plant. Plans have been initiated to get the $260-million construction project going immediately.

Four months of study by the Atomic Energy Commission of more than 100 sites resulted in the choice of a 250,000-acre area on the Savannah River in Aiken and Barnwell counties, S. C. The location is about 20 miles southeast of Augusta, Ga., and 15 miles south of Aiken, S. C.

The money needed to start construction was included in a supplemental appropriation passed by Congress last September. President Truman has requested an additional appropriation of $1 billion from the short-session Congress to expedite work at the new site, and possibly at other sites yet to be chosen. (Another new plant will probably be located along the Mississippi in Arkansas.)

Normally, AEC spends about $1 billion a year for all its operations.

A large part of the projected facilities can be used interchangeably to produce plutonium for bombs of the type being manufactured now or for elements of the proposed super bomb, it is understood.

Operations at the Savannah River Plant will not include the manufacture of completed atomic weapons.

• **Tritium**—Although not announced officially, it is guessed that this plant will begin the difficult process of manufacturing tritium ("heavy hydrogen"), which appears to be the white hope in the production of an H-bomb.

Plants within the site will be operated by the Explosive Division of E. I. du Pont de Nemours & Co., Wilmington, Del. Du Pont brings World War II atomic experience to the task, obtained through building and operating the Hanford, Wash., plant for the production of plutonium. The corporation's engineering department is responsible for design and construction of the plants.

• **Building in 1951**—Construction is expected to start early in 1951; the force required is 8000 men. Steps are being taken to obtain rights-of-way for railroad spurs, roads and utilities needed to facilitate large-scale building operations.

In addition, it is necessary to relocate 1500 families to make way for the plants and to establish the necessary safety and security zone. The dispossessed will receive federal and state assistance. AEC emphasizes that protective measures followed heretofore are proof against radiation hazards and that operation of atomic plants has established a safety record better than in industry generally.

A major factor in selection of the site was a suitable power and water supply. AEC has not decided whether to purchase the enormous amount of power required or to generate it. Water needed for cooling of reactors is estimated at six mgd.

• **Power Sources**—Surveys of adjoining areas reveal some existing sources of electric power and extensive future supplies under development. The Department of Interior's Southeastern Power Administration is likely to be called upon to supply at least some of the electricity.

First units of the Clark Hill Dam on the Savannah, above the site, will be installed in 1952. Clark Hill, under construction by the Army's Corps of Engineers, will have a capacity of 280,000 kw by some time in 1954. Hartwell, another Savannah dam for SEPA, to be constructed by the Corps, will have an initial installed capacity of 90,000 kw and an ultimate capacity of 177,300 kw. First power is due in 1953.

Allatoona Dam on the Etowah River in Georgia presently has 74,000 kw capacity and an ultimate of 110,000 kw. Buford on the Chattahoochee River in Georgia is scheduled for 1955. Initial installations are to produce 43,000 kw and the ultimate is 86,000 kw.

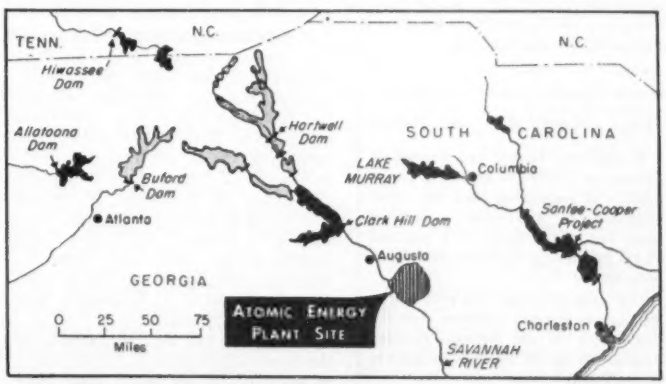
In all, SEPA—by the end of 1954—will be marketing 480,000 kw. from three dams within reach of the new AEC installation and another 173,300 kw could be provided within a few more years.

The high priority of the Savannah River Plant in the nation's defense program may be the spur to speed up Georgia-South Carolina power projects.

• **Site Determination**—Four important factors bearing heavily upon the atomic-energy site selection were:

1. Military defense against attack.

(Continued on page 26)



NEWEST AEC SITE—Southeast of Augusta, Ga., in the pine forests of South Carolina, is the 250,000-acre site selected by the Atomic Energy Commission for construction of plants to produce atomic components. Water and power availability were among criteria. Map shows region's water power projects. Works completed or under way shown in black; works approved or proposed are shaded.

Supreme Court rules on Gypsum pricing

Six producers and U. S. Gypsum held to have profited from "illegal" price-fixing; Court orders patents freed

The 10-year-old antitrust suit against U. S. Gypsum and six other producers of wallboard was just about closed out this week when the Supreme Court held for the government. The charge: that the companies had all profited from an illegal price-fixing arrangement based on U. S. Gypsum's patents.

In June the court handed down an unusual temporary restraining order at the government's request. At that time, it appeared that the court was leaning to a decision against the companies.

• **Gypsum board freed**—In substance, here's what the court has now ruled for U. S. Gypsum, National Gypsum Co., Certain-teed Products Corp., Celotex Corp., Ebsary Gypsum Co., Newark Plaster Co., and Texas Cement Plaster Co., the defendants in the historic case:

(1) The ban on price-fixing through patents should cover not just gypsum board, but all gypsum products;

(2) Gypsum must license its patents on gypsum products to all comers at equal terms.

(3) The judgment against the companies should cover the entire country, and not be limited to just the eastern United States, where the companies now do business;

(4) Standardization of trade practices—including classification of customers, and selling at delivered prices—is illegal when done by concerted action;

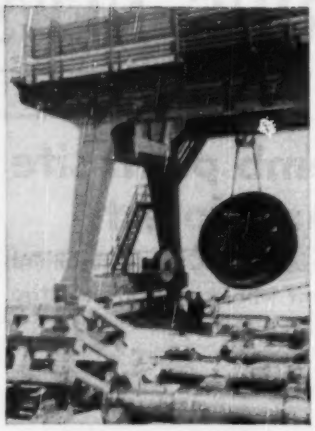
(5) The antitrusters are to be permitted to inspect U. S. Gypsum's books in order to check up on compliance with the court order.

FIRST ADVANCE PLANNING GRANT

Kansas City, Kansas, has received an advance of $73,740 to assist the city in making an engineering study and report preliminary to preparation of detailed plans and specifications for a proposed $6,231,500 sewage collection and treatment facility.

This is the *first large-scale* project to be approved for planning assistance under the new criteria of the Advance Planning Program set up for construction projects in September.

The Kansas City project qualified as an "essential civilian requirement", according to Administrator Raymond M. Foley of the Housing and Home Finance Agency.



CENTRAL VALLEY'S HEART—Assembly begins for motors to make California's great Central Valley Project a going concern. Gantry atop the project's Tracy pumping plant lowers rotor that will be part of a 22,500-hp motor-pump set—the first of six such units. Shafts for the motors appear in foreground. Powered by current generated at Shasta Dam, the sea-level station will push north-valley water uphill to the thirsty south valley.

Atomic energy site . . .

(*Continued from page 25*)

2. Operating requirements, (most of which cannot be disclosed for security reasons.)

3. Accessibility to population centers (to avoid establishing another government community.)

4. Public health and safety.

The new plant is expected ultimately to employ upwards of 25,000 technicians and workers.

A Site Review Committee endorsed the recommendation of the du Pont organization, who made the study of possible sites for AEC and selected the Savannah River area. Members of the Site Review Committee, appointed by AEC, are: L. J. Sverdrup, Sverdrup and Parcel, Inc., St. Louis, Chairman; H. L. Bunce, Jr., Stone and Webster Engineering Corp., Boston; W. S. Finlay, J. G. White Engineering Corp., New York; James F. Towers, Ford, Bacon and Davis, Inc., New York; and A. T. Waidelich, The Austin Co., Cleveland.

Among the first du Pont officials on the scene will be Don A. Miller, works manager of the operating plant, and Robert K. Mason, field manager in charge of construction. AEC local offices will be opened soon by Curtis A. Nelson, manager of the New Operations Office, and Robert C. Blair.

Excess profits tax bill ignores AGC requests

Party vote in House may pass bill reported by Ways and Means; personal service corporations exempted

An excess-profits tax bill, reported by the House Ways and Means Committee, does not have specific exemption for the construction industry.

Although recommendations of the Associated General Contractors of America were received with friendly consideration by Republican members of the committee, (ENR Nov. 30, p 23) a straight party vote put through original Treasury proposals with only a few modifications. On this basis the construction industry did not get special consideration.

The bill reported out does have special exemption for personal-service corporations, however, also unaffected by the bill are partnerships. Contractors, if unable to get special consideration under the law, may find that they are exempted from its application on these grounds.

Republican strength in the Senate may yet force consideration of AGC suggestions in the final writing of the excess profits measure, but it is generally conceded in Washington that current sentiment makes such an exemption unlikely.

• **The tax**—As reported to the House, the new tax bill will take 75% of those profits which, under the law will be labeled "excess."

The base period for determining excess profits will be the three best years of 1946 through 1949. "Normal profits" under the proposed law would be 85% of that three-year average. Total income and excess profits taxes of all income should not exceed 67% of corporate income, however.

Special formulas for growing corporations are included in the measure.

STEEL WAGE-PRICE HIKES BITE

Steel wages and prices have gone up. An average 16-cent hourly wage increase has been accepted by the United Steel Workers, CIO, for its 165,000 members working for United States Steel Corp. At the same time, U. S. Steel boosted its prices 5½% to cover the new labor cost now up $125,000,000 a year.

Identical agreements were signed by Bethlehem Steel. Republic Steel has announced a "similar" offer, also tied to price increases.

Other steel companies are expected to follow the lead of U. S. Steel which makes one third of the steel produced in the United States.

Dunlop, Bates named to serve on wage board

Only construction men on nine man wage stabilization board, Dunlop represents public interest, and Bates labor

Two persons with a construction industry background are serving on the nine-man Wage Stabilization Board just appointed by President Truman. They are John T. Dunlop, a public member, and Harry C. Bates, representing labor.

Dunlop is chairman of the National Joint Board for settlement of jurisdictional disputes in the construction industry. Since the new wage board is only an advisory group to Economic Stabilization Administrator Alan Valentine, Dunlop will continue as head of the jurisdictional dispute board, for the time being at least.

Bates is president of the Bricklayers, Masons & Plasterers Intl. Union.

During the war, both Dunlop and Bates served on the National War Labor Board's Wage Adjustment Board, which administered wage controls in the construction industry.

Chairman of the Wage Stabilization Board is Cyrus S. Ching, on leave as director of the Federal Mediation and Conciliation Service. Construction is not represented among the three industry members, who are Henry B. Arthur, Swift & Co; J. Ward Keener, B. F. Goodrich Co., and Reuben Robertson, Jr., Champion Paper & Fiber Co.

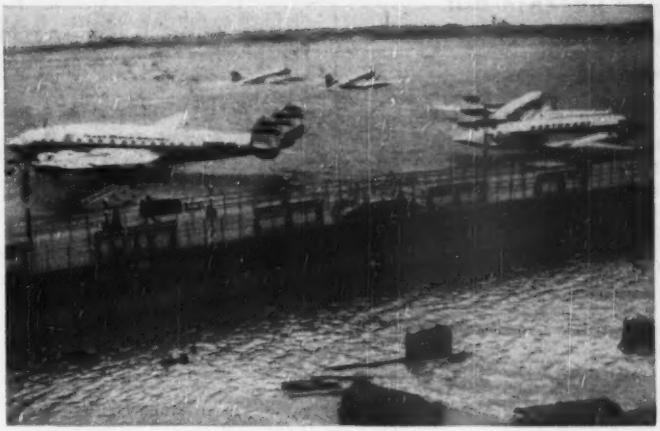
Interior still seeks delay of Roanoke Rapids project

Virginia Electric & Power Co. has asked the Federal Power Commission to set early argument on its license application to construct a hydro-electric project at Roanoke Rapids, N. C. Interior, which opposes the VEPCO plan, is seeking a new time extension.

Oral argument within 10 days of the Dec. 5 deadline for filing exceptions to examiner Frank A. Hampton's supplemental decision of Nov. 15 (ENR Nov. 30, p. 26) was asked by the company. (Hampton had reaffirmed his earlier initial decision in favor of the license for VEPCO.)

Counsel for Interior and the Virginia REA Association, on the other hand, have moved for time to prepare an abbreviated record of the long proceedings, before exceptions are filed.

They point out that the record in the case consists of more than 3,500 pages and about 100 exhibits. Merely reading the record, it is argued, "would be burdensome for the commission, and unnecessarily so."



AIRPORT DIKE TOPPED IN HURRICANE—The East Coast's Nov. 25 storm tested anew many engineered structures. One that had not yet undergone such a blow was New York's year-old dike around part of LaGuardia airport (ENR Dec. 15, 1949, p. 35). Designed to hold back normal annual maximum tides (up to 12.5 ft.) the dike is riprapped on the outside and paved to resist wave action. Storm's 13.75-ft tide overtopped the dike, flooded half of the field, stranded giant planes. The 90-mile winds whipped great waves that attacked the dike. When water subsided, dike's outshore face was undamaged, but top was ragged with one to two feet of bituminous paving and fill washed away. Dike was cut to drain field, then repaired. Wide World photo

DOUGHERTY L.I.R.R. CONSULTANT

Richard E. Dougherty, former chief engineer of the New York Central System, has been named engineering consultant by the commission assigned to reorganize the Long Island into a "safe and efficient" road following the recent train crash which killed 78 persons. The appointment was announced by Robert P. Patterson, commission chairman.

Temporary injunction bid refused by management

Offer of union officials to accept a temporary injunction against the picketing of Brown & Root's construction projects in the protracted injunction suit now under way (ENR Oct 26 p. 24) between that company and the AFL has been refused.

Company attorneys declared the offer a "trap" and went on to say they would press their suit to enjoin illegal picketting and boycotting. Union claims that they were trying to get better wages, hours and working conditions were called a "subterfuge".

The union sought to settle the matter according to Paul Sparks, executive secretary of the Texas Federation of Labor because of the terrific court costs involved in the long hearing. He emphasized that the offer does not concede defeat on the part of the unions.

Fred Lavis dies; expert on Latin American rails

Fred Lavis, internationally known authority on railways and transportation in South and Central America died Nov. 24, at Phoenix, Ariz. Long a resident of Scarsdale, N. Y., he served that community as mayor from 1931 to 1933.

Born in Torquay, England, in 1871, Mr. Lavis came to this country in 1889 and was engaged in railroad surveying around Boston for about a year before going to Cuba in 1890 for his first railroad work in the tropics. Two years were spent in Cuba and two in Colombia on the Cartagena-Magdalena RR during the next decade.

In 1903 Mr. Lavis joined Westinghouse, Church, Kerr & Co. on the Pennsylvania R. R. tunnel and terminal work at New York.

Since 1910 Mr. Lavis had spent most of his time in consulting work including acting as an advisor to the Bolivian Government on railway work in that country, serving as chief engineer of the Argentina Ry. Co., and as president of the International Railways of Central America. From 1924 to 1928 Mr. Lavis was engaged by the State of New Jersey for work on the new approaches to the Holland Tunnel, including the high-level viaduct across the New Jersey meadows. More recently he acted as an advisor to the government of Venezuela on rehabilitation of the Gran Ferrocarril.

Civil Defense Bill enactment expected

Almost $100 million sought for first six months. Proposed agency would deal with states, pay half of shelter costs

Congress last week received an administration-sponsored Civil Defense Bill that has good chances of enactment this month, before the lame-duck session adjourns. With an expected request for something under $100-million to fuel the federal civil defense effort until June 30, the new bill answers many of the urgent questions that held up state and local decisions (ENR Nov. 30, p 24).

Under the new measure powers almost without precedent would be granted the proposed Civil Defense Administration.

• **Provisions**—As introduced, the measure is a redraft of a suggested bill included by the National Security Resources Board in its book, United States Civil Defense (ENR, Sept. 28, p23). The bill would set up an independent civilian agency in the executive branch of the government. Further, it would:

1. Create the position of Civil Defense Administrator at $17,500 with a $16,000 assistant and some 22 top-grade jobs of lesser rank.
2. Give the administrator power to make agreements with states and authorize the states to make compacts among themselves.
3. Require the states and cities to pay for the hiring and equipping of civil defense personnel.
4. Authorize the agency to put up half the money for air-raid shelters. This money would be apportioned among the states on a new basis: "In the ratio which the urban population of the critical target areas in each state—bears to the total urban population of the critical target areas of all the states." Under this arrangement, most of the money would go to the industrial areas of the nation, including Washington, D. C., which is classified as a critical target area.
5. Allow the government to "sell, lease, lend, transfer or deliver" practically any civil defense item to the states, with or without compensation.
6. Permit the Civil Defense Orgauization to take advantage of the broad requisitioning power granted the President in the Defense Production Act of Sept. 9.

• **Truman has acted**—While awaiting legislation, President Truman appointed Millard F. Caldwell, former governor of Florida, to be civil defense administrator. James J. Wadsworth has been serving as acting administrator in NSRB's Office of Civil Defense.

POINT FOUR BOARD NAMED

President Truman has named Nelson A. Rockefeller chairman of the new Advisory Board on International Development. Also named to the 13-man board is John L. Savage, chief designing engineer of the Hoover and Grand Coulee Dams, and consulting engineer to many foreign governments.

ARBA budget cuts will curtail work

The American Road Builders Association has begun tightening its belt—preparing to live within a severely-cut income. According to a budget committee decision, announced last week by Eugene Reybold, executive vice president, the ARBA must get along on $150,000 in 1951 instead of the approximately $250,000 that was spent in both 1949 and 1950.

"Such a drastic cut of necessity makes it impossible to continue activities at present level" said General Reybold. Instead of adding personnel "to fill serious voids in our present organization" as planned, he has been obliged to dismiss several members of the staff. Without more income "further and more drastic reductions will be necessary after June 30 of next year", he warns.

• **Met with CIMA**—The necessity for the budget cuts developed at a joint meeting in Chicago, Oct 12, of ARBA officers and the executive committee of the Construction Industry manufacturers Association. The bulk of ARBA's funds have come from manufacturer contributions.

Attorney General probes Ky. Highway Department

A. E. Funk, state Attorney General has requested two of his assistants to investigate charges of corruption in the State Highway Department of Kentucky.

Funk says the State Police Department will furnish a special investigator to help his men, and has asked Governor Clements to put up $500 from his emergency fund to help meet costs of the investigation.

Earlier Funk had asked a grand jury proble of the charges of bid-rigging and profit-sharing entered against John A. Keck, state highway commissioner, during the recent election.

Three suits against Keck were filed by Hubert Meredith, former state attorney, for Arthur T. Iler and Irvin Hendrix, tax-payers of Muhlenberg County at Frankfort Circuit Court.

Asphaltic concrete chosen for turnpike

New Jersey Authority had taken alternative bids on asphaltic and portland-cement concrete.

Asphaltic concrete has been selected as the surfacing for the entire 118-mile length of the New Jersey Turnpike. The Turnpike Authority had received bids on both asphaltic concrete and portland-cement concrete (ENR Oct. 26, p. 25, Nov. 23, p. 31).

In announcing the selection of asphaltic concrete, Paul L. Troast, chairman of the authority, said that the selection had been made after careful consideration of all factors such as "cost, durability and safety features. Either type of pavement, incidentally, would provide an equally excellent highway."

"Based upon the selection of shoulders decided upon by the authority, the asphaltic concrete would cost $39,403,284, while portland-cement concrete would cost $44,823,418, a difference of $5,420,134 in favor of asphaltic concrete.

"Since designs are on a comparable basis, it was determined also that the use of asphaltic concrete would probably be least affected by today's critical materials supply situation."

• **Cross-section**—The pavement to be laid will consist of 4½ in. of asphaltic concrete over 8-in. of penetration-bituminous and waterbound-macadam base and a 6-in. granular subbase.

Norfolk span-tube origins

There was an earlier chapter to the development of the bridge and tunnel project being built to connect Norfolk and Portsmouth, Va., than was reported in ENR.

In that article it was said that the job was born when the Virginia legislature created the Elizabeth River Tunnel Commission. Actually the idea for a bridge between Norfolk and Berkeley and a tunnel between Berkeley and Portsmouth—not substantially different in type and alignment from the present facility—was proposed in 1941 by the late J. D. Wood, Mayor of Norfolk. He acted on the recommendations given him in an engineering report by J. C. Evans of the Port of New York Authority in association with Abbott, Merkt & Co., consulting engineers of New York.

In October, 1941, the city council appointed a committee with Mr. Wood as chairman to push the bridge-tunnel scheme. It is said that this committee, acting on advice from the above consultants, was chiefly responsible for the legislation.

CONSTRUCTION BUSINESS

Highest November on record for engineering construction

November produced contracts for heavy construction valued at $1,012,046,000. This is the highest volume on record for this month and the highest weekly average for November awards. It brings the 11-month total to $10,926,988,000 the highest ever reported by ENGINEERING NEWS-RECORD and an increase of 47 percent over the 11-month volume for 1949.

This gain is in dollar volume. Physical construction, measured by the ENR Construction Volume Index is up 41.2% above 1949 for the 11 months to 480: 1913 = 100.

Private contracts in November score $518.9 million to push the 11-month total to $6,322 million, a gain of 78% over 1949, an all-time record.

Public contracts go on record at $493 million for the month, $4,605 million for eleven months and an 18 percent gain over 1949.

Three classes of work set their highs for the year in November, public housing with an average of $10.8 million a week, earthwork, drainage, waterways, at $13.4 million a week, sewerage at $8 million a week. Waterworks at a $2.7-million average week scored its year's low; mass housing privately financed its second low, $39.7-million average against the low $35-million average last month.

Industrial building was at its 4th highest rate, a $33.3 million per week average. This was topped by the record averages for August, September, October of $44-59 million a week.

The largest construction gains for the year to-date are chalked up by private unclassified construction, principally pipelines, 89%; private mass housing 82%; commercial building 70%; industrial building 70%; public buildings 39%; streets-roads 36%.

Only two types of construction are lagging behind last year—earthwork, drainage, waterways, 17% and public housing, 14%.

While the dollar volume gain over 1949 for heavy construction in the eleven months is 47% for the whole country, the Midwest volume is up 78%, South 62%, Far West 50%. West of Mississippi volume is up 37%, New England 36% and Middle Atlantic 33%.

Steel price increase sends cost indexes up

With lumber pulling them down and steel pushing them up the ENGINEERING NEWS-RECORD Construction and Building Cost Indexes for December are up, but only fractionally from their November values. They are still 1% below their all-time October highs. The new December values are 528.73 for the Construction Cost Index and 390.14 for the Building Cost Index, both based on 1913=100. This compares with 527.85 in November and 534.44 in October for construction costs and with 388.85 in November and 396.23 in October for building costs. The new index values are 10% higher than those of November 1949.

Before the $5 a ton rise in structural steel prices, announced for Dec. 1, these indexes had backtracked 1% for the second month in a row due to lumber prices, which came down again during November, 4.7% for pine and 5.5% for fir, measured by the 20-cities average for 2x4s. Cement prices climbed again, almost 1% on their 20-cities average.

Wages held on common labor but a few small increases came through for carpenters (in Atlanta and Cincinnati) and iron workers (in Boston and Cincinnati).

Compared with December last year, both the ENR Construction and Building Cost Indexes are up 10%, cement is up 4.4%, structural steel 12.3%, sand 3.9%, fir 2x4s 21%, pine 2x4s 19.8%, common brick 7.5%, ready mixed concrete 3.3%, structural clay tile 2.6%, common labor 6.4%, skilled labor 4.5%, bricklayers 4.2%, structural iron workers 4.1%, carpenters 5.3%—all on ENR 20-cities averages.

Cement price increases came through during November in Los Angeles, New Orleans, Pittsburgh, Seattle, also a freight increase on cement in Detroit.

Lumber prices dropped: pine 2x4s in Baltimore, Chicago, Detroit, Kansas City, New Orleans, New York, spruce in Boston. Fir 2x4s dropped in Baltimore, Boston, Chicago, Denver, Kansas City, Los Angeles, Minneapolis, New York but went up in Detroit.

ENGINEERING CONSTRUCTION CONTRACTS REPORTED TO ENGINEERING NEWS-RECORD—NOVEMBER, 1950

Engineering News-Record reports continental U. S. Construction projects of the following minimum costs — Waterworks, excavation, drainage and irrigation, $28,000; other public works $50,000; industrial buildings, $68,000; other buildings, $250,000

Five Weeks — Thousands of Dollars (000 Omitted)

	November, 1950						—U. S. Cumulative—			%	
	New England	Middle Atlantic	South	Mid-West	West of Mississippi	Far West	Total U. S.	Eleven Months 1950 (48 wks.)	1949 (47 wks.)	Change '49-'50 Aver. wk.	Canada Nov., 1950
Public Works											
Waterworks	404	984	3,575	657	6,326	1,480	13,426	204,678	188,924	+ 6	5,015
Sewerage	696	11,797	4,403	6,969	7,510	8,402	39,777	269,031	257,776	+ 2	718
Bridges	3,135	5,582	7,649	3,972	5,879	2,726	28,943	337,565	319,485	+ 3	1,474
Earthwork and waterways	270	497	10,955	129	24,410	30,863	67,124	384,359	476,641	−17	603
Streets and roads	5,638	18,280	21,348	15,631	28,683	11,233	100,813	1,166,027	836,432	+36	546
Public buildings, residential	3,196	21,325	14,898	839	10,864	2,855	52,975	311,581	353,942	−14	4,667
Other public buildings	11,614	35,170	21,972	32,885	34,856	26,680	163,177	1,552,115	1,091,804	+39	26,865
Unclassified	3,675	6,260	4,758	3,565	5,277	2,332	25,867	359,788	287,033	+23	5,251
Total public	**28,628**	**99,895**	**89,558**	**64,647**	**123,805**	**86,569**	**493,102**	**4,605,154**	**3,812,037**	**+18**	**45,139**
Federal government (included in above classifications)	1,925	5,223	17,335	10,823	27,727	37,477	100,510	1,112,805	929,670	+17	10,071
Private											
Bridges	.....	50	.....	.....	.....	.....	50	9,795	10,025	− 4	.....
Industrial buildings	1,999	10,609	62,345	52,291	27,196	12,270	166,710	1,533,324	884,346	+70	16,229
Com'l buildings, residential	1,456	91,539	26,579	37,099	24,395	17,258	198,326	2,985,080	1,604,818	+82	7,754
Other commercial buildings	6,603	20,622	9,105	13,667	41,505	8,748	100,250	924,066	531,263	+70	5,657
Unclassified	.....	28	11,953	2,312	20,207	19,108	53,608	869,569	451,353	+89	24,625
Total private	**10,058**	**122,848**	**109,982**	**105,369**	**113,303**	**57,384**	**518,944**	**6,321,834**	**3,481,805**	**+78**	**54,265**
Total Engineering Construction:											
Nov., 1950 — 5 weeks	**38,686**	**222,743**	**199,540**	**170,016**	**237,108**	**143,953**	**1,012,046**	.....	.....	.....	**99,404**
Oct., 1950 — 4 weeks	20,192	173,397	139,376	218,718	305,644	93,199	950,526	.....	.....	.....	119,276
Nov., 1949 — 4 weeks	44,781	152,225	70,470	64,642	193,649	63,457	589,224	.....	.....	.....	41,469
Eleven Months — 1950	**470,555**	**2,574,343**	**1,773,606**	**1,703,709**	**2,755,122**	**1,649,633**	.....	**10,926,988**	.....	**+47**	**722,730**
Eleven Months — 1949	338,500	1,901,289	1,072,332	938,071	1,969,101	1,074,549	.....	.....	7,393,842	....	574,328
% Change '49 to '50	+36	+33	+62	+78	+37	+50	.....	.....	.....	.....	+23

BIDS AND BIDDERS

(Major project news received after Construction Reports, page 109, went to press.)

Generating Plant—Public Service Company of Illinois, Chicago, awarded contract for superstructure of electric generating Plant 9, at Waukegan, to Bates & Rogers, Chicago, at $12,000,000.

Housing—George H. Rommel, Louisville, Ky., was low at $6,358,177 for constructing West Housing project in Louisville, at the Municipal Housing Commission, Louisville, letting Nov. 29. Fred Hartstern, Louisville is architect. E. R. Ronald & Associates, Louisville, are engineers.

Coastal Drainage Program—Government of British Guiana, Georgetown, plans coastal drainage program to cost $43,000,000 and harbor improvements at New Amsterdam at $3,840,000.

Hospital Addition—Presbyterian Hospital, Chicago, plans constructing 8-story hospital addition. Estimated cost is $3,000,000. Burnham & Hammond, Chicago, are architects.

Housing—Omaha Housing Authority, Omaha, Neb., opened bids Nov. 29, for two housing projects. Sherry-Richards Co., Chicago, was low bidder at $4,389,730. Leo A. Daly, Omaha, is architect.

Paper Mill—Syndicate PC J. R. Smalluvrid, St. John's, Newfoundland, plans paper mill at Lake Melville, to cost $3,000,000.

Apartment Hotel—Bagley First State Corp., Detroit, Mich., will complete by own forces an apartment hotel in Detroit. Cost is about $3,000,000.

School for Blind—James L. Barnes Co., Springfield, O., was low at $2,300,000 when bids were opened Nov. 16, for constructing School for Blind, in Sharon Township. The State of Ohio, Department of Public Works, Columbus, opened bids November 16. Outcault, Guenther & Associates, Shaker Heights, are architects.

Housing—Chicago Housing Authority received low bid from Jacobson Brothers, Chicago, at $2,322,000 when bids were opened Nov. 27. Project includes four apartments and an office building. George F. and William Keck, Chicago, are engineers.

Medical Office Building—T-S Construction Engineers, Inc., Ford J. Twaits, Inc. and Morrison-Knudsen Co., Inc., have been awarded contract to erect a $2,000,000, 10-story medical office building in Los Angeles, for the Wilshire Medical Properties, Inc., Los Angeles. Emil Heitschmidt, Los Angeles, is architect.

Gypsum Mill—Syndicate PC Dr. A. A. Valdmanis, St. John's, Newfoundland, plans gypsum mill at Humbermouth, to cost $2,000,000.

Stores and Office—Estate of Rogers Lacy, Dallas, plans constructing 20-story, store and office building in Dallas to cost $2,500,000. W. P. Moore, Houston, is engineer. Wilson, Morris & Crain, Houston and John B. Danna, Houston, are architects.

Residences—Property Sales Co., Baltimore, Md., plans constructing residences, near Baltimore. Estimated cost is $2,000,000.

Receiving and Treatment Unit—California State Division of Architecture, Sacramento, Calif., received low bid for constructing receiving and treatment unit, at Napa State Hospital, Imola, Calif., from H. Mayson, Oakland, at $2,397,533. Anson Boyd, Sacramento, is State architect.

Sewage Disposal Plant—Mancini-Miller-Thompson Construction Co., East Detroit, at $1,821,976 was low bidder for sewage disposal plant, at the City of Saginaw, Mich., bid opening Nov. 28. Hubbell, Roth & Clark, Detroit, are engineers.

New Jersey Turnpike—In addition to the $33,000,000 contracts awarded earlier this week, the New Jersey Turnpike Commission, Trenton, announced contract to Union Building & Construction Co., Passaic, at $1,324,925 for substructure and superstructure Overpeck Creek Causeway, Bergen County. Howard, Needles, Tammen & Bergendorff, New York, are consulting engineers. Award was also made to Poirier & McLane Corp., New York, at $1,015,300 for superstructure of Oak Island Viaduct and Turnpike Bridge, Newark.

High School—R. R. Jacobucci Inc., Quincy, Mass., was low at $1,107,545 for constructing high school at Middleboro, Mass., when Town of Middleboro took bids Nov. 22. J. William Beal & Sons, Boston, are architects. Mark Linenthal, Boston, is engineer.

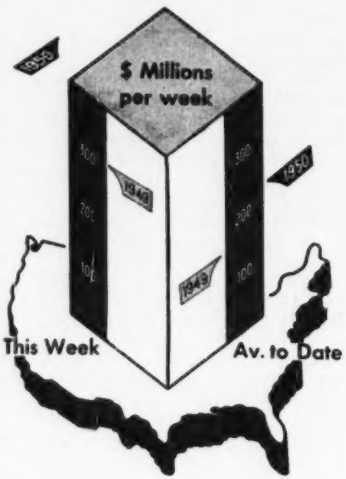
Dwellings—Grandview Building Co., Beverly Hills, Calif., plans constructing dwellings in Monterey Park to cost $1,555,000. Allen G. Siple, Beverly Hils, is architect.

COSTS AND VOLUME

ENR INDEX NUMBERS

Index Base = 100		1913	1926	1949
Constr. Cost	Dec.'50	528.73	254.16	110.84
Bldg. Cost	Dec.'50	390.14	210.89	110.90
Volume	Nov.'50	410	167	118

NOTE: Figure for 1950, below, is 480+.



Activity This Week

As reported to ENR (in millions of dollars)

Amount of contracts let

	Week of Dec. 7, '50	Cumulative 49 wks 1950	1949	% chge
Federal	$265.3	$1,378.1	$1,150.8	+20
State & Mun.	109.5	3,601.8	2,989.0	+21
Total Public	$374.8	$4,979.9	$4,139.8	+20
Total Private	110.1	6,431.9	3,675.8	+75
U. S. Total	**$484.9**	**11,411.8**	**7,815.6**	**+46**

Contracts by type of work

	This Week	Cumulative 49 weeks 1950	1949	% chge
Waterworks	$3.6	$208.1	$201.8	+ 3
Sewerage	7.6	276.7	269.5	+ 3
Bridges	6.7	354.1	340.7	+ 4
Highways	52.2	1,218.1	866.4	+41
Earthwork, Waterways	4.5	408.8	513.4	−20
Buildings:				
Public	294.2	1,846.4	1,302.0	+42
Housg., pub.	4.4	316.1	357.9	−12
Housg., priv.	36.4	3,021.2	1,723.6	+75
Commercial	15.9	940.0	544.8	+73
Industrial	51.2	1,584.7	922.5	+72
Unclassified	8.2	1,237.6	780.9	+58

NOTE: Minimum size projects included are: Waterworks and waterway projects, $34,000; other public works, $60,000; industrial buildings, $82,000; other buildings, $300,000.

New capital for construction

	Cumulative 49 weeks 1950	1949	% chge
NON-FEDERAL	$522.0	$432.5	+21
Corporate Securities	2,181.3	2,103.2	+4
State and Municipal:			
Excl. housing	2,231.4	2,020.9	+10
Housing	648.4	777.9	−17
FEDERAL	2,829.1	1,711.7	+65
Total Capital	**$8,412.1**	**$7,046.2**	**+19**

Housing commitments put at half million

Cost and market factors will determine starts ahead; drain on housing commitment reserves hard to estimate

Estimated housing commitments outstanding on Oct. 12—when Regulation X and its FHA-VA counterparts took effect—have to be taken with a grain of salt in appraising what they will produce next year in the way of residential construction starts. Figures being kicked around in Washington put the housing units committed before Regulation X at half a million. The estimates are undergoing a check by FHA and VA field offices that will take a month to complete.

How many of the commitments will be translated into starts next year is a matter of opinion. But some housing people think the estimated half million units on file Oct. 12 assure a substantial boost toward the tentative target of 800-850 thousand starts next year.

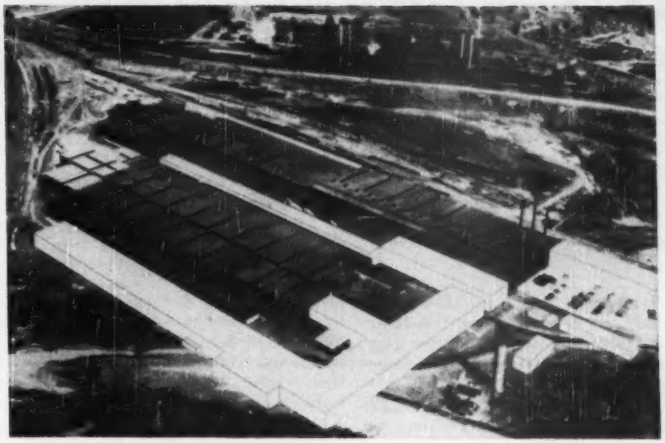
Accepting the estimates as sound, discretion still has to be used in judging how many housing starts will actually flow out of the commitments next year. Two things have to be considered: first, the willingness of builders to go ahead on the basis of assured loans; second, the drawdown on the Oct. 12 reserve caused by putting committed dwellings under construction this year.

• **Cost factors**—On the first question, many factors will affect the carrying out of the commitments by builders. One of the most important is costs. Since July 19, FHA and VA valuation appraisals on new housing applications have been based on prices and costs of July 1. Costs have risen about 7% since that date.

As for apartment projects under section 608, those jobs are tied—for FHA valuation purposes—to costs as of Dec. 31, 1947. The cost index has dipped and climbed in the 35 months since then. Right now, costs seem to be stabilizing, at least temporarily.

Cost and market factors will largely determine whether builders go ahead with their projects. On many sites, the builders already have made substantial improvements. Most observers feel today that builders will start housing for which construction loans and permanent financing are assured.

The drain on the Oct. 12 reserve up to the end of the year is hard to estimate. A number of the committed units went into construction during October, when 103,000 dwellings were started. Smaller numbers will be included in the starts for the month just ended and for December.



RIVER WILL MOVE—Republic Steel Co. recently announced what it calls the biggest single expansion of steelmaking capacity ever undertaken in the Cleveland area. To cost $75,000,000, the expansion will add 672,000 tons to the plant's annual capacity. One of the building construction jobs that will take place is outlined on the photograph. It is an addition to the strip mill. The Cuyahoga River, not navigable at this point, will have to be diverted around the site.

Navy jet overhaul plant dedicated and in service

The Navy has dedicated the nation's first all-jet engine overhaul plant at Quonset Point, R. I., Naval Air Station.

The $3,500,000 structure occupies 162,500 sq ft of floor space and replaces a reciprocating engine plant destroyed by fire in 1948.

Ayers-Hagan, Inc. and the Rome Construction Co. turned the building over to Comdr. Richard F. Armknecht, public works officer in charge of the plant's construction.

First 5-yr plant writeoff goes to Jones & Laughlin

The first necessity certificates designed to encourage expansion of production capacity for defense purposes by providing for accelerated tax amortization are eight in number and involve new facilities estimated to cost $144 million. They go to Jones and Laughlin Steel Corp. who had filed with the National Securities Resources Board on October 30. They should increase steel ingot capacity by 1.2 million tons, coke and related by-products by 266.4 thousand tons.

NSRB loan forms ready for businessmen

There will be future business for engineers and construction contractors coming out of this:

Stuart Symington, chairman of the National Security Resources Board, announced last week that forms are now available for private business enterprises to apply for direct government loans under terms of the Defense Production Act of 1950.

Applicants may file their forms in Washington with the appropriate department — Commerce, Agriculture, and Interior or the Defense Transport Administration—which are the certifying agencies.

Outside Washington, applications will be accepted at field offices of the certifying agencies.

The certifying agencies will be held responsible for thorough investigation of the applications. When approval has been given, the Reconstruction Finance Corporation will act as agent for making the loan.

Symington said that the funds must be used for expansion of capacity, development of technological processes or production of materials that are essential.

In addition, he said, funds will be loaned only if it can be shown that their use will speed production and deliveries or service to aid in carrying out government contracts for national defense.

Loans will be granted only when the applicant is unable to obtain them from private financial sources, with or without government guarantee, or from other public sources on reasonable terms.

U. S. Chamber of Commerce hears plans to relieve municipal traffic congestion

Plans shown for decentralization of government bureaus in Washington, D. C., over 20-mi radius; trends to suburbs discussed

Vincent B. Smith
ENR Washington Bureau

Ailing American cities got a new lease on life last month in Washington. A businessmen's conference of the U. S. Chamber of Commerce listened to practical plans—now being carried out—for rebuilding run-down areas, relieving traffic congestion and financing off-street parking in various cities.

• **D. C. decentralization**—On another urgent question—urban development and national security—the business representatives got the hard-headed word of industrial and commercial experts, along with the federal government's plans for progressive decentralization of its huge Washington establishment. The latter proposals tied in with the long-awaited master plan for the Washington metropolitan region, outlined last week by the National Capitol Park and Planning Commission in its report, "Washington—Present and Future."

In its comprehensive plan for the area in and around the District of Columbia, the NCPPC discussed all the specific problems for which solutions were offered at the businessmen's conference. Its whole concept, the NCPPC said, was based on action by the federal government—Washington's basic employer, equivalent to manufacturing industries in other cities—to decentralize departments and agencies into nearby Virginia and Maryland.

Korea applied a spur to the government's program—aimed at the same objective. President Truman at the end of August asked Congress for $140 million as a starter toward putting activities employing 40,000 at a safe distance outside the central city. Eventually, the plan proposes to disperse the employment centers for 100,000 workers, with high-speed roads to connect the peripheral units and the core, as explained to the conference by James W. Follin of the General Services Administration.

• **Federal plan delayed**—The proposal went to Congress without adequate forewarning to the members and to the officials and planning commissions of affected areas adjacent to the district. Hearings were held, but the President's request did not get beyond Congressional Committee.

For the 82nd Congress meeting in January, the dispersal plan is being refurbished for another try; this time, it is expected to win approval. According to Congressional report, the original dispersal proposal by the National Security Resources Board—responsible for policy recommendations under the National Defense Act—called for putting the new agency centers 40 to 50 miles beyond the heart of the city. But this plan was modified to meet objections of the budget bureau and the inter-agency staff working with the General Services Administration.

• **Revisions shrink radius**—The revised proposal reduced the dispersal ring to a 15-20 mi radius, on the assumption that the shorter distance would be just as safe and would allow easier commuting. Even the 15 to 20-mile dispersal goes beyond the NCPPC's suggestions, prepared before Korea.

But whether decentralization is carried out for security purposes or for other reasons, it achieves the main objective of the planning commission—to spread working places and population over a wider area.

• **Industries have other criteria**—Decentralization of private businesses—manufacturing industries and commercial outlets—is governed by other factors than security against atomic attack, the conference was told. The controlling factor in most decisions is nearness to market, said Roland R. Randall, Philadelphia realtor.

Trends to the suburbs are causing depreciation of high-tax areas and producing traffic and parking difficulties in the cities, director of the census Roy V. Peel said, in analyzing decentralization problems. City streets require more maintenance, new arterial thoroughfares must be built, and at the same time extremely valuable property is lost as a tax source through conversion to parking lots.

• **Finance for parking**—Businessmen from a score of cities offered some solutions to these problems during the two days of meetings. On the subject of financing off-street parking—to get vehicles off the pavement and attract shoppers to the central area, Lyman E. Wakefield of Minneapolis told how downtown business interests in his city had formed a parking corporation that is already taking bids on two parking decks, to cost $2,000,000, for 1400 cars. Faster action than that possible with municipal sponsorship results, he pointed out, and the projects will be self-amortizing and will pay taxes.

A somewhat similar plan of private financing—the highly successful park and shop—had been carried out by enterprising businessmen of Allentown, Pa., as described by Donald Miler, secretary. But in both Des Moines and Grand Rapids, local business people turned to the city for sponsorship of off-street parking. In Grand Rapids, projects now under way will be leased to private operators, but in Des Moines, the city will operate the off-street garages. One is of unusual type, nine stories high, with cars handled to individual stalls by elevator and crane, thus avoiding usual car-moving troubles.

MAZE EXPERIMENT—Residents of a Detroit residential district, harrassed by through traffic, recently got official cooperation on an idea for making their streets quieter: They put diagonal barricades at several intersections so cars would have to turn at just about every corner. After a 30-day test the Detroit Common Council voted to remove the barriers, replace them with four-way stop signs. Vote followed two stormy public hearings, where police and fire departments were loudest complainants against the maze.

Bus executives lash tax plan at hearing

Attack Nelson report ton-mile theory; claim report ignores public service aspect of bus transportation

Vigorous opposition from bus transportation officials and representatives of the trucking industry has developed in Olympia, Wash. at public hearings held by the highway interim committee of the state legislature.

Hearings concern the report of James C. Nelson, highway economist and Washington State College professor, who suggested revision of highway taxes on a ton-mile basis of tax distribution. The Nelson report would virtually double highway-user taxes on diesel trucks and markedly increase taxes paid by heavy buses (ENR Nov 23, p 31).

Representing the Washington Motor Coach Assn. was Thomas J. Hanify. The Nelson report, he said, failed to consider the use the public gets out of buses and "ignores entirely the value of the service."

The tax proposed, Hanify said, "penalizes the efficiency of heavy vehicles." A passenger-mile basis would be preferred as a method of equalizing the state's highway tax distribution.

Another alternative to the Nelson proposal came from Fred Cohen. A gross revenue tax, Cohen said, would pay for the highway use of buses.

State trucking rules hit by Knudson of D.T.A.

State regulations which work an undue hardship on truck operators were criticized by James K. Knudson, member of the Interstate Commerce Commission and head of the newly-created Defense Transport Administration, in a talk before delegates to the state public utilities commissioners convention at Phoenix, Ariz.

"While there are valid reasons for some variations between states in laws governing weight, length, and height of trucks, we cannot condone regulations which harass, hamper and act as a barrier to transportation," he said.

He stressed that if the war emergency becomes more critical, there will be a need for heavier loading of trucks—partly because of the railroad boxcar shortage.

He condemned burdensome license and tax requirements on truckers and said that the fleet owner's regulations may have to be relaxed to speed the flow of truck traffic across states.

"In time of national emergency, state limitations on transportation have an even more serious effect on our economy than in peace."

SADDLETANKS—Air-transportability is the objective of tests the Corps of Engineers is running on construction equipment now at Fort Belvoir, Va. Items include standard equipment in lighter classifications and special equipment where standard machines exceed the specified 16,000-lb weight limit. Ballastable tanks over rear wheels allow operators to increase traction of this tractor, which weighs 16,000 lb with tanks empty, therefore can be carried in an airplane.

Md. finds poor roads poor politics

Poor roads, a sales tax, and communism joined early in November to put over what political observers call an "election upset" in Maryland. The upset marked only the third time that a Republican governor has been elected in the predominantly Democratic state since the Civil War.

As in most states, the present Governor W. Preston Lane, Jr. inherited a war-damaged road system. But here there was delay in getting roads up to standard. In fact, up to 1947 Maryland was diverting a large part of its gasoline tax money to non-highway uses. After a re-appraisal of the rapidly crumbling road system, Lane came up with a multi-million-dollar program.

But there was a gimmick to the places where roads would be improved. Lane and his politicians decided where the state roads commission would authorize work. Thus, a short section of a local road, between Wheaton, (a Washington, D. C. suburb) and Washington was hurriedly let for contract and work ordered pushed two weeks before election when it became apparent that Montgomery County (through which it ran) would go Republican.

• **The county went Republican**—The county is enrolled two-thirds Democrat; the vote was two-third Republican. Meanwhile, routes like Maryland's 193 (connecting U. S. 29 with U. S. 1) were totally neglected.

Two trucks cannot pass each other at many points on Route 193. Capacity is such that backups of cars stretching one to two miles occur often at the several stop-lighted intersections. This road is typical of the number that the Lane administration "passed over" because it didn't have enough voters along its length.

• **The scapegoat bucked**—Meanwhile Maryland has been enforcing its maximum truck weight limits and its efforts were recently publicized in an article printed in a mass-circulation magazine. The blame for the poorly-built and poorly-maintained roads was laid at the feet of the truckers.

It didn't fool the voters. Disgusted with the poor roads, the sales tax, and the tolerance of communists, Maryland voters threw out Governor Lane and Democrat Senator Tydings and elected former Baltimore mayor, Republican Theodore R. McKeldin as governor and a comparatively unknown lawyer as senator to replace Tydings.

Trucker must pay $10,901 for bridge crash damage

L. Folker Sons, of Bridgeport, N. J., owners of a trailer-truck that allegedly struck the end post of a steel-truss bridge spanning the Swatara Creek in Middletown, Pa., must pay the state $10,901.85 for expenses incurred when the bridge collapsed under one of its trucks last September.

A jury in Dauphin County Court has directed the New Jersey firm to make payment.

The state claimed that the end post of the bridge was struck with such force by the motor vehicle that the span collapsed into the creek bed with the 8-ton trailer-truck, its driver and 12 tons of potatoes.

Red chips were found, the state said, similar to the paint on the vehicle at and around the end post.

Lawyers of the Folker firm contended that it was an aged bridge erected in 1904 and simply collapsed under the weight of the tractor-trailer and its cargo.

What about rubber in pavements?

• Test installations of bituminous pavements containing small quantities of rubber indicate that rubber improves the characteristics of the mix. Little is known yet about the permanence of the improved qualities nor of the cost of obtaining them.

V. T. Boughton
Associate Editor,
Engineering News-Record

WHAT DO WE KNOW about the effect of adding small quantities of rubber to bituminous paving materials? Are there facts to support the claims of greatly improved qualities and longer life that have appeared in most newspaper reports of the laying of test sections of pavement containing rubber in various parts of the country?

Briefly, the answer is that we have learned very little to date, but what has been learned is so encouraging as to warrant further study of the possibilities of rubber as an admixture in bituminous surfacing for streets, highways and airfields.

There is no evidence to support claims that the life of bituminous pavements will be doubled by this treatment; there is some evidence indicating that the useful life of pavements will be extended materially.

Laboratory tests show that the addition of rubber, in amounts ranging from 1 to 15% of the weight of asphalt in a bituminous mix, decreases the ductility and flow of the mix and raises the softening point. These changes are advantageous. They reduce the tendency for bituminous pavements to creep at high atmospheric temperatures under the rolling action of tires, and they minimize the "bleeding" of asphalt from the pavement when atmospheric temperatures are high. The permanence of these improved characteristics is yet to be determined.

There is some evidence to support the claim that the addition of natural rubber increases the skid resistance of bituminous pavements, but the difference in skid resistance, when compared to similar new pavement without rubber, is not striking. On the other hand, there is evidence to show that pavement containing rubber does not lose its skid-resistant qualities in the early years of its life as rapidly as does pavement without rubber.

Little is known yet about costs—other than that the addition of sufficient rubber to produce the anticipated improvements in the characteristics of a bituminous pavement adds appreciably to its cost. Certainly, until we know more about the permanence of those characteristics and more about the number of years that rubber may add to the life of a pavement, any claim that rubber will "stretch the highway dollar" is premature.

If the advantages that now appear probable from the use of rubber are supported by the tests now in progress, it is safe to assume that costs will be lowered as the production of rubber powder and rubber compounds for highway use are put on a commercial basis.

Finally, we know little about the relative advantages of natural rubber as compared to synthetic or reclaimed rubber. In some of the test installations that were laid for purposes of comparison with normal types of bituminous surfacing without rubber it was assumed that more reclaimed rubber than natural or synthetic rubber should be added to obtain similar properties. Time alone will tell whether that assumption was correct.

• Early tests in Holland—The first test pavements containing rubber were laid in Holland in 1929. Additional test sections were laid there between 1935 and 1941. Unfortunately, very few records were kept concerning the quantities of rubber in those test sections or the character of the mix.

About all that is known is that rubber in amounts ranging from one to ten percent of the asphalt by weight was added to the surfacing on the test sections. Most of the test sections were thin, being spread by hand at rates not exceeding 18 to 30 lb per sq yd. Several sections of paving in which natural rubber was used have given unusually long life when compared to other sections built to the same specifications, but without rubber. There also was evidence to show that surfacing containing rubber gave better protection to the subgrade against the damaging effect of moisture.

The present interest in the use of rubber in asphaltic paving materials originates from these Netherland test sections.

• First tested at Akron—Powdered rubber as an admixture for asphaltic concrete was first used in the U. S. at Akron, Ohio. Small test sections of pavements were laid there in 1947. The following year about a mile of Exchange Street, a major east-west artery carrying a heavy volume of both truck and passenger-car traffic, was resurfaced for half its width with asphalt containing rubber. The other half has no rubber and serves as a control section.

The original street surfacing was brick, laid between 1917 and 1921. After irregularities had been leveled out, a binder course 1½-in. thick and a surfacing course of 1 in. were laid, using the Ohio T-35, Type A asphaltic concrete on both the treated and untreated sections. Rubber powder in quantities ranging from 5 to 7½% of the weight of bitumen was added to the treated areas, using government standard synthetic (GR-S) in the form of crumbs finer than 40 mesh. The asphalt was heated to about 300 deg, after which the rubber powder was sifted in slowly and agitated for two hours. It was then allowed to stay in the mixing tank overnight but was reheated before being mixed with the aggregates. Laying followed normal practice.

• Asphalt improved—Rubber raised the softening point of the asphalt and lowered its penetration. The asphalt used had a 70-80 penetration, which dropped to around 63 when 5% rubber was added and to 57 when 7½% was put in.

Another early test installation was made in 1948 by the B. F. Goodrich Company at its research center at Brecksville, Ohio. Four sections of road 10x100 ft were laid, one containing natural rubber crumbs, one containing natural rubber crumbs made from ammonia preserved latex, a third containing GR-S synthetic rubber crumbs, and a fourth containing ground tire-tread peels of about 20-40 mesh. The rubber amounted to 7½% of the weight of asphalt in each case.

Rubber crumbs were added to the hot aggregate in the pug-mill and the mixing cycle was increased from 30 to

PAVING CONTAINING RUBBER was laid this year on the Worcester Pike near Boston. Maintenance of traffic during the resurfacing was facilitated by the fact that asphalt containing rubber can be used sooner than untreated asphalt.

60 seconds over standard practice. The contractor reported that the hot mix handled in a normal manner.

• **Other test sections**–State highway departments began to lay test sections of pavement containing rubber in 1949. Such installations now have been made in Virginia, Ohio, Texas and Massachusetts. Additional test pavements have been laid in Akron, Ohio, also in Columbus, in Baltimore, and in New York City. Natural rubber and synthetic and reclaimed rubber were used in these tests.

The first test pavement laid in Virginia was put down on 1,000 ft of U. S. Route 250 just west of Richmond, a 3-lane highway (ENR July 7, 1949, p 52). For that work, natural rubber at the rate of 8.4 lb per ton of mixture (about 6% by weight of bitumen) was added to the standard sand-asphalt surfacing material of the Virginia Highway Department. This powder was predominantly between the 20 and 80 mesh sieves. It was added to the hot (300-325 deg), dry aggregates in the pug-mill. After mixing for 15 sec, the asphalt, heated to 215 deg, was added and mixing continued for 45 sec.

This mix was placed with a standard paver at a thickness of about ½ in., or 65 lb per sq yd, which is about the minimum thickness that can be laid with a paver. At that rate, a mile of 30-ft pavement would require 4,800 lb of rubber, and a two-lane 20-ft highway would require 3,200 lb per mile.

An adjoining section was laid in the same manner but without rubber in the mix, for purposes of comparison.

Later last year a 500-ft section of the same highway was laid with surfacing containing 6% reclaimed rubber. The reclaimed rubber powder was much coarser than the virgin rubber used in the first section, being predominantly between the 10 and 40 screen. Immediately following the rolling, particles of the reclaimed rubber were visible above the compacted surface.

In July of this year a 500-ft section of bituminous plant-mix sand-asphalt was laid on Virginia Route 302 in Charlottesville, using synthetic rubber.

No unusual construction difficulties were encountered in laying these sections, but the paver laying the mix containing natural rubber had to be operated more slowly (8 ft per min) as against a normal 12 ft per min to prevent "pulling". Slower operation was not required with the reclaimed or synthetic rubber.

Virginia also laid 0.6-mile of seal treatment with cutback asphalt (RC=2) containing 5% of natural rubber. This asphalt was applied at the rate of 0.27 gal per sq yd and covered with 25 lb per sq yd of chips and then rolled with a 7½-ton roller followed by a rubber-tired roller.

Although the rubber mixed readily with the cut-back asphalt (heated to 180 deg), addition of the powder required considerable time and slowed up the pavement sealing operation.

• **Additional tests in Ohio**–During July and August of last year the Ohio Department of Highways laid more test sections in and around Akron and at Columbus totaling to 3,800 ft. The longest was on North Main St. in Akron, where eight test sections having a continuous length of 2,500 ft. were laid, also a control section of 932 ft. The eight test sections contain natural, synthetic or reclaimed rubber from various commercial producers, the natural and synthetic rubbers being added at a rate of 5% by weight of the asphalt cement and the reclaimed rubber at 7¼%.

Each was laid over an old pavement that had been prepared for resurfacing by the application of a base course of bituminous concrete (Ohio Type T-35 A or C) ranging in thickness from 1 to 1¾ in. And the surfacing to which the rubber had been added was of the same material laid 1 or 1¼ in. thick.

• **Effect of rubber on placing**–Slight differences in handling mixtures containing rubber were noted in Ohio. The material appeared heavier and more tacky after mixing and after spreading. A slight "tearing" was noted behind the middle third of the screed during laying. Most of the checks resulting from the tearing action were obliterated in the rolling.

rubber-treated surface but they had increased on the control section indicating a loss of skid resistance in the surfacing without rubber.

A third set of tests, just completed, shows little change from last November. On a wet pavement, with a car traveling at 40 mph, the stopping distances vary from five to ten feet in favor of the sections with natural rubber. For sections containing reclaimed rubber the difference was only about three feet.

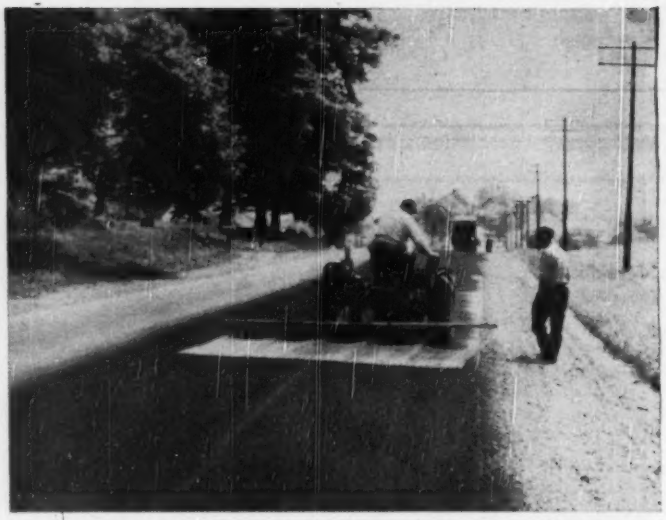
• **Cost of adding rubber**—Except in the instance of the paving operations recently completed on U. S. Route 1 in Massachusetts and on Falls Road in Baltimore, which were normal contract paving jobs, no accurate estimate of the cost of adding rubber to bituminous mixes can be made because the pulverized rubber used in practically all the other tests is not being produced on a commercial basis. Also, the cost will depend on whether natural, synthetic or reclaimed rubber is used and on whether larger quantities of reclaimed rubber may be required to produce results similar to those obtained with natural rubber.

Excluding the work on U. S. Route 1 in Massachusetts and the Baltimore work, all rubber used in the tests reported here was supplied without charge by the interested rubber producers—Goodyear Tire & Rubber Co., and the Firestone Tire and Rubber Co., both of Akron, Ohio; U. S. Rubber Co., New York; Midwest Rubber Reclaiming Co., St. Louis, and the Natural Rubber Bureau, Washington, which also represents the British and Dutch rubber producers. If a considerable market for powdered natural rubber develops as a result of these tests, it is expected that powdered natural rubber can be sold at a cost well below 50 cents a pound.

Assuming that the cost of powdered natural rubber might be 40 cents a pound, and applying that to the sand-asphalt surfacing job in Virginia, where the surfacing material containing rubber was applied at a rate of 65 lb per sq yd, the cost of the rubber per mile of 24 ft wide pavement would be $1536.

The price of synthetic rubber is government controlled. At present it is 18½c in slab form. Pulverizing these slabs will raise the cost for paving work to around 40c a pound, or substantially the same as natural rubber powder according to the U. S. Rubber Co. The Goodyear company sets the cost at half that amount.

Reclaimed rubber, however, can probably be produced in pulverized form for about 12c; hence, if it proves to be satisfactory, its use will materially reduce the cost of adding rubber to pavements, even with some increase in the total amount of rubber used.



A TEST OF THE SKID-RESISTING VALUE of asphalt containing rubber when used for "deslicking" is under way in Ohio. A chain drag here is shown finishing the surface.

P. W. Litchfield, Chairman of the Board of the Goodyear Tire & Rubber Co., in a statement made early this year, estimated that the addition of rubber powder in an amount equal to 5% of the weight of the asphalt oil to the conventional asphalt mix, applied at a thickness of 1½ in. on a 24-ft highway would add $1,000 per mile to the cost of that highway.

In a report on the initial test installations in Akron, M. D. Wilson, associate engineer, Department of Public Service, says concerning costs: "It is estimated that the additional cost for the rubber should not exceed 10 cents per square yard for a surface course 1 inch thick." For a mile of 24-ft pavement 1½ in. thick this would amount to $2,100. This estimate was made about a year earlier than that of Mr. Litchfield.

On the large paving job on U. S. Route 1 in Massachusetts, inclusion of the rubber compound added about 8.5 cents to the cost of each square yard of binder course and 15.4 cents per sq yd of surfacing.

Converting the cost of this surfacing for comparison with the preceding estimates give a figure of $1,160 per mile of 24-ft pavement 1½-in. thick, in which the rubber amounts to 5% of the asphalt.

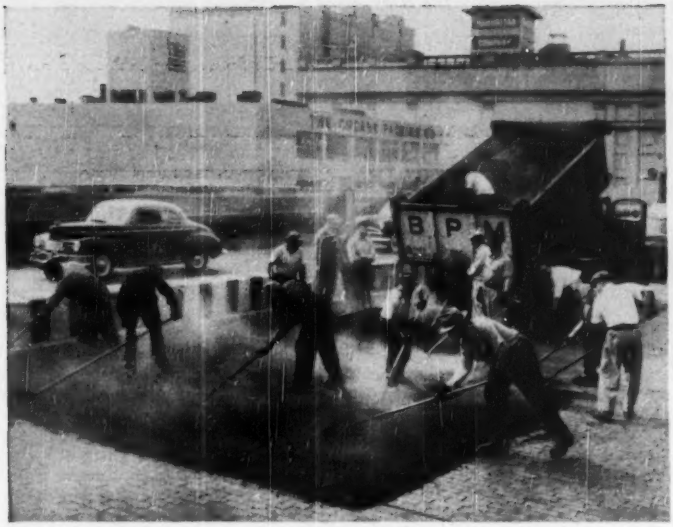
Estimates of the cost of the recent work in Baltimore based on $14.00 a ton for topping (yielding 18 sq yd per ton when laid 1 in. thick) and $10.60 a ton for binder (yielding 16.5 sq yd per ton at 1-in. thickness) put the cost of pavement without rubber at $1.43 per sq yd. Adding 11.5 lb of natural rubber to each ton, at 40c a pound, raised the cost to $1.81 per sq yd, or an increase of 38c per sq yd for 2-in. thick pavement.

This price of 40 cents a pound for the 10,000 lb of powdered rubber required for the job, which was paid by the city's Bureau of Highways, does not include freight and delivery charges, nor any charge for bagging the powder in the exact amounts required for each batch of paving.

• **No construction problems**—Use of rubber introduces no special construction problems. On some jobs the mixing was slowed when rubber was added in powdered form, but no delays were experienced on other jobs, indicating that whether or not delays can be expected depends on the type of equipment used.

On some jobs it was found necessary to slow the rate of advance of pavers laying asphalt containing natural rubber powder, but that was not a universal experience. There also was some tearing of the surface behind the paver on some projects. This tearing, however, was of no significance as the marks disappeared under the rolling.

• **Paving mix improved**—Engineers of the Massachusetts Department of Public Works are convinced that the addition of rubber materially improves the characteristics of their bituminous mix. The product is more homogeneous as it comes from the paver, with no evidence of free asphalt on the surface, it can be rolled more quickly and apparently requires less rolling.



NEW YORK CITY IS TESTING bituminous paving containing rubber on its heavily travelled West Side Elevated Highway, which is paved with granite blocks.

Roller imprints did not appear to be as deep as in the control sections without rubber. Hand raking was slightly tougher in the turnouts.

• **Pavement deslicking**—Virginia recently laid six experimental sections to determine the effect of rubber on asphalt used for deslicking. They are on N. S. Route 11 south of Natural Bridge. The following types of surfacing were put down: rock asphalt, slag seal treatment, lean sand F-1 mixture and lean manufactured sand (stone) F-1 bituminous mixture. These last two were further divided into two portions, one containing natural rubber and one without rubber.

• **One section in Texas**—The Texas Highway Department has laid a test section on U. S. 81 northeast of San Antonio as part of a widening and resurfacing project to determine the effect of rubber admixture in that climate. It is 1,500 ft long and 50 ft wide. The surfacing containing rubber is 1½ in. thick. Rubber powder was added at the rate of 12 lb for each 4,000-lb batch of hot-mix asphaltic concrete, which contained 5.3% of 90 penetration asphalt. This rubber is roughly 6% by weight of the asphalt.

Engineers of the Texas Highway Department did not find that the addition of rubber made any difference in handling of the surfacing. The only raking they did was at joints and no difficulties were encountered there.

Rubber powder was weighed out in advance and put in paper sacks. It was added to the mix through the inspection door of the pug-mill after the hot aggregates had been introduced. This manual introduction of powder increased the mixing time, but that was the only delay resulting from the use of rubber.

• **High percentage in Massachusetts**—Test installations using both emulsified rubber and a "meltable rubber compound" were laid last year by the Massachusetts Public Works Department, one on Route 2 at Concord and one on Route 1A at Wrentham. In this resurfacing work both the binder course and the surfacing course are 1¼ in. thick. Both the emulsified rubber and the compound were added to the binder at a rate of 10% by weight of the asphalt and at a rate of 15% in the surfacing course. This was the first instance of rubber being added to the binder course. It was done to avoid any difficulty due to differential expansion.

Both installations were found to be in such satisfactory condition this spring that larger installations of each were included in the program for this year, which comprises about 20 miles of pavement containing rubber. The first of these to be completed was 5.2 miles of four lane pavement on U. S. Route 1 near North Attleboro (ENR Sept. 28, p32).

For this project the same proportions of rubber compound used last year at Wrentham were employed, 10% of the weight of asphalt in the 1¼ in. binder and 15% in the 1½-in. surfacing. The compound used was "Surfa-Scalz," a product of the Naugatuck Chemical Division of the U. S. Rubber Co., which contains 60 to 65% rubber. It was added hot in a melted state to the hot asphalt.

The actual amount of rubber in these mixes is about 6½% of the asphalt in the binder and around 11% in the surfacing.

• **Other test sections in cities**—New York City began putting down test sections in 1949 and has added more this year. Sheet asphalt containing rubber was laid last year on the north half of 25th St. between First and Second Avenues, on the south side of 51st St. between Park and Madison, and on Academy St., between Sherman and Vermilyea Aves. It was laid over 1½ in. of bituminous binder. A fourth section was laid on the West Side Express Highway, West lane, having 1 in. of surfacing over concrete.

Three variations of the city's standard sheet asphalt mix were used. Type A contained about 1% of melted processed rubber (Surfa-Scalz) replacing an equal quantity of asphalt cement. In Type B, 0.6 of 1% of ground reclaimed rubber was added to Type A. In Type C, 1% of ground reclaimed rubber was added to Type A.

On June 17 of this year five test sections, each about 100 ft long, were laid over the granite block on the southbound roadway of the West Side elevated highway on a curve near West 12th St. One was a control section of the regular Manhattan formula for sheet asphalt. Two sections contain natural rubber amounting to 0.55 of 1% of the total mix; a third contains 0.75 of 1% of reclaimed rubber; and the final section contains 0.75 of 1% of synthetic rubber.

Within recent weeks the City of Baltimore laid on Falls Road 2,000 ft of 1-in. bituminous concrete binder containing 5 lb of rubber per ton and one inch of sand-asphalt topping containing 11½ lb. per ton. The contractor on that work, the Baltimore Asphalt Block & Tile Co., states that no time was lost due to using rubber. The laborers engaged in adding limestone dust to the pug-mill also added the rubber powder, which was delivered by the Bureau of Highways in paper bags containing the correct amount for each 2-ton batch.

• **Skid tests begun**—Skidding tests having the longest record are the ones begun in Virginia immediately following laying of the test section on Route 250 early in 1949. Only slight differences in stopping distance were found at the time of construction. Six months later (November, 1949) the stopping distances for various speeds were substantially unchanged on the

If traffic runs over it before the pavement is completed, there is less damage than with the normal mix.

Studies made by Virginia's Council of Highway Investigation and Research indicate that the range of temperatures at which rubber powder can be blended successfully with an asphalt mix is rather limited. At high temperatures, decomposition of the rubber was observed, and at low temperatures the resulting mix was not uniform.

• **What about the future?**—By the end of this year enough test installations will have been made to provide an adequate variety of field tests even though the use of rubber for paving purposes is cut off to help build up the nation's rubber reserves. Supplementing these field studies will be research in laboratories of the state highway departments and in the large laboratory being built for that purpose by the Natural Rubber Bureau.

It will be many years, however, before all the answers to questions relating to rubber in pavements are obtained, due primarily to the anticipated long life of the test installations.

Earliest results can be expected from seal treatments containing rubber because of the shorter life of such treatments. Thus we should soon know whether the addition of rubber does reduce the "bleeding" of asphalt from seal treatments, which is one of their chief defects, and whether rubber extends the life of seal treatments.

More also will be known soon about the permanence of the somewhat higher skid resistance that rubber imparts to pavements.

From Britain comes a report of a novel experiment with rubber in pavements (*Civil Engineering*, London, Oct. 1950). Two pavements using a normal mix were laid by the highway department of the Leicestershire County Council, one with and one without rubber, and these were supplemented by two other sections, one with the normal mix except for a deficiency in the binder and the other similarly deficient in binder but with rubber powder added. This deficiency in binder is expected to shorten the life of the pavement, thus demonstrating at an earlier date what effect rubber has on the life of the pavement.

• **Airfield pavements**—A type of service that appears to have attractive possibilities for bituminous mixes containing rubber is in paving for airfields. To learn something of these possibilities, test installations were laid when Friendship Airport at Baltimore was being paved and the Navy just recently laid pavement containing rubber on a field to be used by jet planes. Fuel spilled by jet planes softens asphalt pavements, hence it is expected that this test installation will show whether use of rubber will check or prevent that type of damage.

These test pavements on airfields also should show whether the addition of rubber will check the deterioration of asphalt pavements on runways due to infrequent passage of planes over the surface. Asphalt pavement requires the kneading action of traffic to maintain its flexibility.

Largely unexplored are the possibilities of adding rubber to pavement with tar as their base. Such pavements have been used on runways for jet planes, as tar is not softened by spilled fuel, but there is no knowledge of what effect rubber might have on the life or serviceability of tar pavements.

Information used in the preparation of this report was supplied by Tilton E. Shelburne, director of research, Council of Highway Investigation and Research, Charlottesville, Va.; Charles W. Allen, research engineer, Ohio Department of Highways; Marvin L. Davis, director of public service, Akron, Ohio; Gordon McLean, Massachusetts Department of Public Works; Jed N. Robinson, construction engineer, Texas Highway Department; Anthony J. Donargo, chief engineer, Borough of Manhattan and W. W. Dyckman, engineer of maintenance; W. L. Chilcote, deputy highways engineer, Baltimore; Harry K. Fisher, rubber road consultant, Natural Rubber Bureau, Washington, D. C., and representative of the rubber companies listed above.

Four year program favored at MIT

A faculty committee at Massachusetts Institute of Technology that has been studying the school's training program for about three years has recommended that the school concentrate on a four-year undergraduate training for engineers. It recommends increased emphasis on science and the humanities and rejects the suggestion frequently made that engineering undergraduate curricula should in general be increased to five or even six years. Also, the committee states that it does not believe that engineering education should follow the lines of law and medicine.

The committee states that the institute's expansion during the war threatens the unity of the faculty and student body that has been one of MIT's greatest assets. Consequently it would limit enrollment to the present level or slightly lower.

Concerning the schools undergraduate program the committee states: "We reject the view that there is one particular curriculum suitable to prepare men to be leaders of society and another distinct type suitable for specialists in techniques who are to be servants of the policy makers. We believe that if the problems chosen for study are alive and complex, with social and ethical dimensions, the curriculum of the technological school can be an excellent medium for the development of leaders competent to handle the urgent social and political problems that now confront the world."

To that end the committee recommends that the primary objectives in undergraduate years be general ones of developing intellectual power rather than accumulation of information. It would reduce the detailed content of courses, emphasize fundamental principles and development of powers of judgment, strengthen the instruction in humanities and social sciences, make greater allowance for differences in student aptitudes and avoid loading the student up with obligations that give no chance for reflection.

Concerning the relation of undergraduate work to graduate study, the committee states that "we ought either to reaffirm our faith in our kind of undergraduate education and fortify it to meet the needs and competition of our day or prepare to abandon it in favor of a different kind of institution devoted to other objectives. We have concluded that the former is clearly the better one for MIT. We recommend establishment of an appropriate balance by strengthening and revitalizing undergraduate education rather than by curtailing the achievements of the graduate school."

Questions concerning sponsored research also were raised by the committee. "Is all this work genuinely creative? Can it be justified on the ground that it strengthens the educational program? Is there danger that the energy and interests of talented members of the staff are being diverted from education to income-producing work?"

The committee does not attempt to answer these questions specifically, but from what it recommends concerning sponsored research in the future the conclusion can be drawn that it believes that too much attention has been given to sponsored research.

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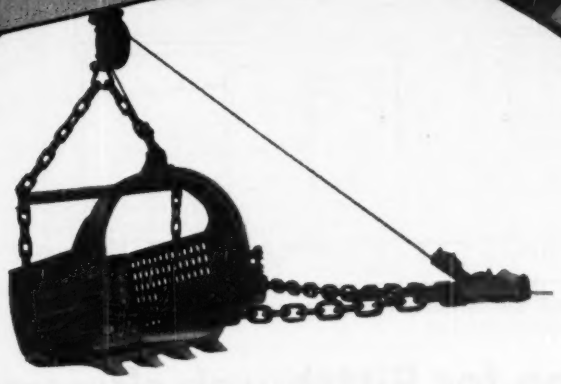

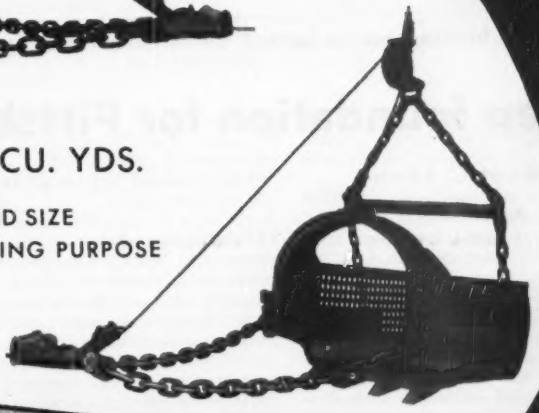

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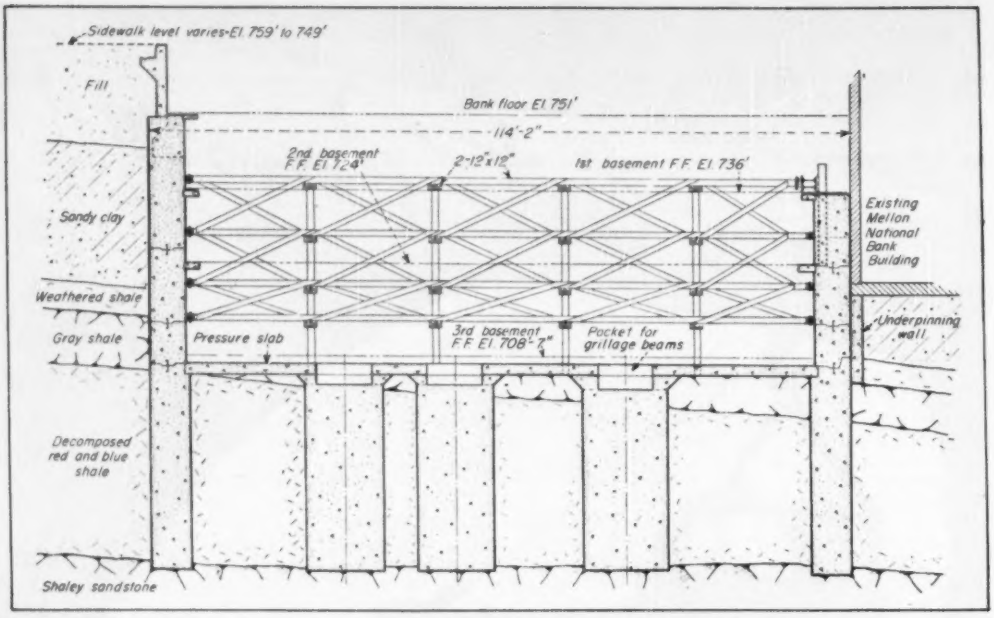


Cross-lot bracing resists lateral earth thrust during construction of . . .

Deep foundation for Pittsburgh skyscraper

Robert C. Johnston
Associate
Moran, Proctor, Freeman & Mueser,
Consulting Engineers
New York, N. Y.

CONSTRUCTION of foundations for the 525 William Penn Place Building in Pittsburgh, Pa., was a classic sheeted-and braced deep-foundation job—almost. A tight construction schedule, vehicular and pedestrian congestion, and underpinning of an existing building wall introduced variations.

The new building will be 41 stories high. To be completed early next year, it will contain offices for the United States Steel Corp. and the Mellon National Bank. The adjoining Mellon National Bank Building, which was underpinned, will be connected at several levels, including the banking floor, to the skyscraper.

The site extends 240 ft along the south side of William Penn Place, between Oliver and Fifth Avenues, in the city's most congested downtown area. Depth of lot is 120 ft.

Deep excavation was required for this job for two reasons: (1) The building will have three basements and a banking floor that is partly below ground, because sidewalk grades range from El 749 to 759. (2) Satisfactory bearing material is as much as 90 ft below street grades.

• **Substructure design** — Foundation structure is basically a reinforced concrete box supported on concrete piers. Exterior walls vary in thickness from 2 to 6 ft and are designed to withstand earth and hydrostatic pressure, plus surcharges, from surrounding streets and buildings. Lateral support is provided in the completed building by the steel floor girders and concrete floor slabs. Because of differences in floor levels in the basements, structural steel columns were designed to resist the additional bending moments due to eccentricity of the thrusts carried by the girders.

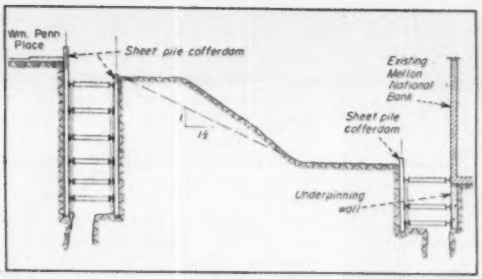
The floor slab in the third basement, which forms the base of the box, is 2 ft thick. It was designed to take a hydrostatic uplift head of 27 ft, as well as normal floor loads.

A 1-ft thick crushed-stone and tile drainage system was installed over this slab, to insure a dry basement. It also provides space for machinery footings, piping and machinery drip trenches, without the necessity of cutting into the pressure slab. Finally, a 4-in. concrete slab was cast over the drainage course to provide a finished floor surface for the third basement.

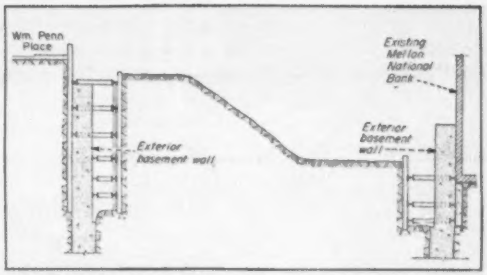
All construction joints in pressure slab and walls are copper waterstopped. In addition, the entire third-basement slab and interior of all basement walls are finished with a 1-in. waterproofing coat.

• **Subsurface conditions** — Upon demolition of the old Hotel Henry, which previously occupied the site, preliminary work got under way during early months of 1949. Drilling of 13 borings indicated that fill and foundations of previous buildings extended down to about El 740 and that there were occasional, massive brick piers well below this level. Below El 740, a generalized soil section shows 26 ft of sandy clay, with some gravel. Under this is 4 ft of weathered shale. And under the shale, the upper surface of the bedrock would be found at about El 710. Individual borings show considerable variation from this generalization.

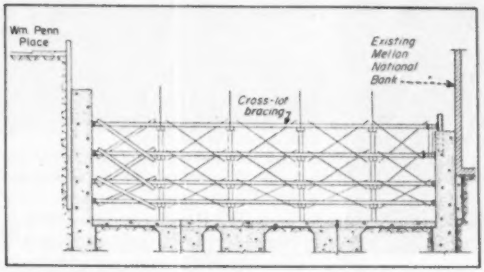
Bedrock at the site is typical horizontally bedded, Western Pennsylvania shale and sandstone, which varies in strength charactertics. The top 7 to 10 ft of rock is a dense uniform gray shale, limited by the Pittsburgh building code to a bearing capacity of 15 tons per sq ft. Underlying this upper gray shale are 20 to 30-ft thick



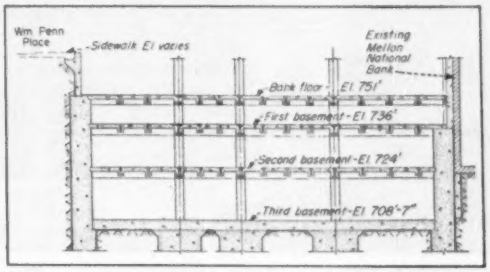
FIRST STAGE—Sheet piles were driven to form an open cofferdam, which was excavated and braced.



SECOND STAGE—Exterior basement wall was cast, the interior of the lot being partly excavated.



THIRD STAGE—Cross-lot bracing was installed in the excavation and the piers and pressure slab poured.


Wm. Penn Place
Sidewalk El varies
Existing Mellon National Bank
Bank floor - El. 751'
First basement - El. 736'
Second basement - El. 724'
Third basement - El. 708'-7"

FINAL STAGE—Structural steel was erected and the concrete floors placed, taking the lateral thrust.

strata of irregularly weathered and partly decomposed red and blue shale. Since these soft strata are not a satisfactory foundation material for the loading required, it was necessary to carry the foundations down to a stratum of gray shaley sandstone lying near El 675. This material allowed a bearing load of 20 tons per sq ft.

Groundwater was found at El 715, during drilling operations. Normal pool level is at El 710, and expected flood levels range up to El 733. Because of drought conditions in the area, however, groundwater level during construction was well below the expected levels. Readings obtained in two groundwater-reading wells on the property showed water to be below El 710, except for one short period when it rose to El 714. The low water levels materially simplified construction problems.

Construction followed procedures decided upon well before work started:

• **First stage**—After preliminary excavation, the foundation contractor—John F. Casey Co.—drove a double line of steel-sheet piling around the three street sides of the lot. Set 9 ft apart, driven into the top of the rock, the two lines of sheeting formed the sides of an open cofferdam. Next, along the wall of the adjoining building, Casey drove a single line of sheeting 9 ft from the existing foundation. To divide the cofferdam into cells, he inserted steel-sheet diaphrams. Then he excavated the cells, bracing the sheeting with H-beam wales and struts as he proceeded.

With the cofferdams in place, Casey excavated the interior of the lot until the center was at El 735. He planned to place the top tier of cross-lot bracing just above this level and left berms against the sheeting to take the lateral thrust from the cofferdam struts until bracing could be set.

Meanwhile, work was started on underpinning of the adjoining building wall. This wall was supported on piers bearing on the upper gray shale. To carry the wall to satisfactory bedrock, the contractor placed underpinning walls between the piers within horizontal breast-boarded pits. When underpinning work was completed, he excavated the cofferdam until he reached good sandstone shale stratum. As a final check, he took diamond drilled cores from the rock at intervals within the cofferdams to be certain that all pier and cofferdam subgrades were below the unreliable shales.

• **Second stage**—As excavation in each section of cofferdam was completed, exterior walls were concreted in segments. Below the third basement subgrade, walls were poured against vertically cut rock faces. Above basement subgrade levels, walls were cast with a formed inner face, while the steel sheeting provided the exterior face form for the walls.

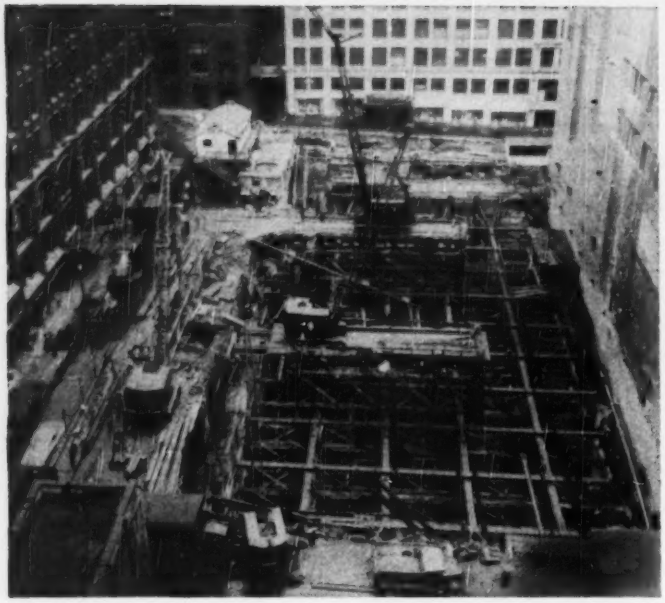
• **Third stage**—Four tiers of cross-lot bracing were inserted. When exterior walls were completed, Casey installed the upper tier and stressed it with steel wedges set between steel plates at each end of the bracing. Inclined spur braces from the top bracing tier were used to support exterior walls where necessary on the high sides of the lot.

General excavation was then continued to just below the level of the second tier, which was installed and stressed in turn. In this manner, the four tiers were inserted, each brace being made of two 12x12-in. timbers, carefully spliced, aligned and supported. Timbers were located so that all structural steel could be set without removing the bracing.

During excavation, the cross-lot bracing system was supported on pairs of timber piles driven to below subgrade level. After subgrade was reached, the bracing was posted to rock.

While the bracing system was in place, the contractor maintained a fire-protection system and fire patrol.

After excavation was completed to subgrade, interior piers, which were to carry a maximum load of 4,574 tons each, were sunk through the upper strata of shale to good, 20-ton bearing material. Rock was removed from pier



CONGESTED SITE cramped the contractor's operations. Cranes operated on sidewalks and on truss-supported platforms over the cross-lot bracing.

shafts by line drilling on all sides on 4-in. centers, to form a neat break line. Then, rock was shot and excavated by clamshell bucket.

During this period, the contractor's cranes worked from two ingeniously designed platforms at street level. Supporting trusses for these platforms were provided by the American Bridge Co. Casey installed them and drove supporting piles. After completion of the foundation piers, the platforms were left in place and were later used by the American Bridge Co. to erect structural steel.

Interior piers were reinforced at the top and tied into the pressure slab, so that in the event of a rise in water level, sufficient weight would be present to counteract uplift during construction and previous to setting of structural steel. In this way, enough weight was developed to resist uplift of water to El 720.

• **Fourth Stage**—As interior piers were completed, the pressure slab was concreted. Finally, as structural steel was erected and basement floors were poured and cured, lateral loads from the exterior walls were permanently transferred to the floors.

Jack Warner was superintendent for John F. Casey Co. Turner Construction Co. is the general contractor, with George M. Reeves as local project manager.

The building was designed by Harrison & Abramovitz and W. Y. Cocken, architects, with Moran, Proctor, Freeman & Mueser as consultants and designers of the foundations. At the site, John F .O'Brien represented the architects and W. H. Ruland the consultants.

Hydraulics group studies pumps, gates

Developments in sewage pumps, advancements in hydraulic dredge design and operating experiences of high-head reservoir gates were covered by prepared papers and panel discussions in the civil engineering hydraulics session of the Sixth Annual National Conference on Industrial Hydraulics held in Chicago.

The meeting was sponsored by the Illinois Institute of Technology and seven engineering societies.

The development of sewage pumps has been a continuing process throughout the past 50 years, said H. T. Sward, Fairbanks, Morse & Co., with one of the latest innovations being the so-called "bladeless impeller" pump. Manufactured in sizes of 2-in., 3-in., it eliminates the conventional two-part impeller and simply continues the suction line through the pump by twisting the line much as you would a flexible pipe and revolving it in the volute or casing.

The chief advantage of this type of pump is its non-clogging feature. For a specific size of solids, it is from 10 to 25 times more free of clogging than conventional trash pumps, when handling fibrous trash.

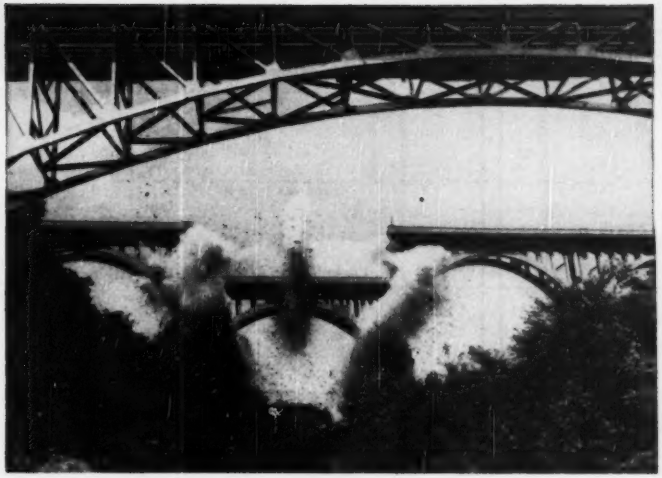
Another recent improvement in sewage pumps, said Sward, is the mixed-flow or angle-flow pump. It is similar in design to the non-clog pump except the impeller may be of 2, 3 or 4-blade design. These are taking place of conventional non-clog pumps in 12-54 in. sizes, he said.

• **Hydraulic dredges**—It is unlikely that the hydraulic dredges of tomorrow will be much larger than those of today, except in special cases, according to J. E. Yager, Bucyrus-Erie Co. Those in use today, with 28-in. and 30-in. discharge lines, are about as large as general contractors can operate economically due to limitations of auxiliary equipment, and the lack of available dredging jobs to keep them going. Unusual jobs, however, may call for the development of larger dredges, such as the 40-in. hydraulic dredge considered in the 1948 discussions of a sea-level Panama Canal (ENR Jan. 29, 1948 vol. p. 143).

Prior to the beginning of World War II, said Yager, there were only 57 cutterhead pipeline dredges in the United States, ranging in size from 18-in. to 30-in. Since then, there have been few important additions to the fleet. This is probably due to a lack of definite prospects for new dredging work on a large scale.

• **High-head gates**—The operation and maintenance of gates and valves under hydrostatic heads of 100 ft or more, continue to be serious problems on several reservoir projects, declared W. G. Weber, Bureau of Reclamation. These difficulties include cavitation pitting of concrete under sliding gates, electrolytic action between rollers and endless chains operating roller-mounted gates, and rubber seals which often extrude under the high pressures.

Laboratory experiments, however, on new types of sliding and roller-type gates, as well as operating experiences on those now in service, are producing continued improvements in gate design. The end result, concluded Weber, should be high-head gates that will function more efficiently and dependably while at the same time requiring less maintenance.



CENTER SPAN was blasted clear after pavement cutters had cut roadway and footwalks. End pressure later caused adjacent spans to collapse without blasting.

REINFORCING STEEL was in excellent condition after 35 years in slag concrete.

Precision dynamiting obliterates concrete bridge

THE CITY of Akron, Ohio, having finished its new steel bridge over the Cuyahoga River Gorge, found that getting rid of the old concrete arch bridge wasn't going to be an easy task.

The old bridge, built in 1913, was a five span structure containing an estimated 5,000 yd of concrete in its foundations and superstructure. It was, incidentally, one of the first concrete bridges built in the United States using blast furnace slag as coarse aggregate.

The structure was 200 ft above the gorge at its highest point, its five arch spans were each 127 ft long and it had two 75 ft approach spans with a 26 ft roadway and a 5 ft cantilevered walk on each side.

The problems were several:

1. The new steel structure was only 120 ft away;

2. Property in the surrounding residential area must not be damaged, but a deep stratum of shelf rock (an excellent transmitter of blast shock) underlay the entire area;

3. The area under the old bridge is an Akron municipal park, and the city planned that the broken concrete be placed in a carefully defined disposal area in accordance with contours established to blend with the adjacent bank of the gorge.

Officials of the Cuyahoga Wrecking Co. of Cleveland, awarded contract for the demolition, decided that blasting was the best method.

On careful study it was determined that since the disposal area was principally under the center span, the blasting could be planned so that as much material as possible would fall in or close to this area.

It was decided to drop the center span (No. 3) straight down and drop the adjacent spans (Nos. 2 and 4) toward the center, taking advantage of the steep rocky bank to bring the broken concrete toward the center.

Accordingly, the roadway and sidewalks of the center span were cut through at both ends, to make sure that adjoining spans would not be pulled over prematurely. The arches of the center span were then drilled and loaded with 50 percent gelatin dynamite at the center and ends of the charge. All charges were set off simultaneously, and the span dropped straight down, as planned.

With the center span gone, there was nothing to resist the thrust at the open ends of the adjoining spans. The arches of both spans sagged slightly, and the piers inclined slightly from the vertical toward the center.

After observation for several hours did not reveal any great movement, it was thought the spans would hold. However, at 10 p.m. the evening of the day the center span was blasted, span 4 shifted endward toward the center and collapsed into the disposal area. Two days later span 2 started to shift, the area was cleared and guarded, and that evening the span moved endward toward the center and collapsed also into the disposal area.

Spans 1 and 5 were on short piers which were stiff enough to resist the thrust toward the open end. These, and the approaches, were blasted so that they fell toward the center area.

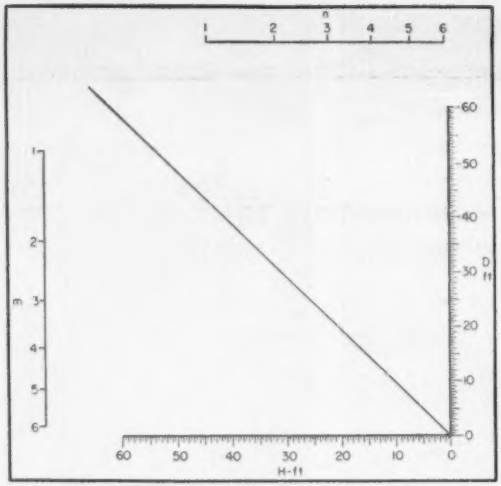
After the bridge was down, heavy equipment, including two cranes and two bulldozers, were moved in. The long drop to the rock floor of the gorge had broken most of the concrete into pieces that could be handled. The large pieces were further reduced by a 3,300-lb steel drop ball and then the cranes and bulldozers moved the broken concrete to the established lines and grades, raising the natural grade as much as 20 ft in some places.

Earth is now being distributed over the area and the seeding and planting is to be done.

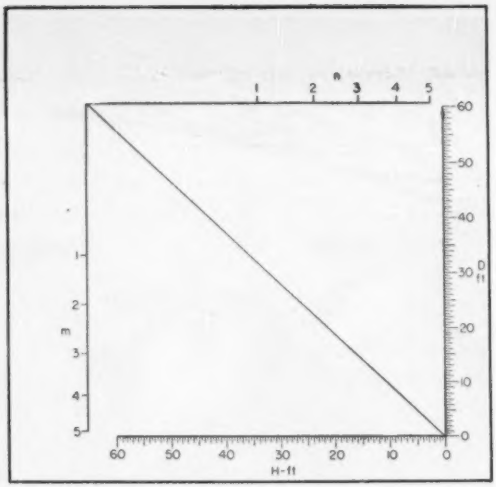
Leonard Sogg, general manager for the Cuyahoga Wrecking Co., was in charge of the demolition job, with A. W. Nelson as project superintendent.

Meanwhile, the National Slag Association, of Washington, D. C., took occasion to comment that after the bridge had been demolished, a study of the concrete showed it to be in good condition after 35 years of service.

Fred Hubbard, director of research for the association, said, "Photographs of the steel as we found it—partly embedded in the concrete—with no attempt to clean it in any way—show that the edges of the twist on the bars were in nearly all cases sharp and apparently in the same condition as when placed. The general condition was such that the steel could have readily been reused were it possible to salvage it in straight lengths."



CASE 1—Nomogram gives vertical spacing of bracing frames within a cofferdam. In this case, a triangular pressure diagram is assumed, and no top frame is used.



CASE 2 also assumes a triangular pressure diagram but takes into consideration a frame at the top to resist impact of any collision against the outside of the cofferdam.

Vertical spacing of cofferdam bracing

Frederick J. Sanger
Associate Professor of Civil Engineering
Worcester Polytechnic Institute
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TWO METHODS are in common use for design of sheetpile cofferdams: (1) sheetpile size is selected and bracing frames are spaced so that the piles will be fully stressed; (2) a number of frames is assumed and spaced so that each frame takes the same load—then sheetpile section is selected.

In this second method the problem is in solving for vertical spacing of the frames to insure their equal loading for either triangular or trapezoidal pressure diagrams. (Water and soils of no shear strength will give the triangular pressure diagrams; most soils will give trapezoidal diagrams, the shape depending on the type of soil.)

The accompanying nomograms and table were devised for solution of this vertical spacing problem.

• **Case 1**—Conditions are: Triangular pressure diagram, no top frame used. The symbol n is the number of frames selected for a trial design; m is the ordinal number of the frame to be spaced, counting from the top; H is the height of the pressure diagram; D is depth of the frame numbered m, measured from the top of the diagram.

The equation for finding depth of frame—upon which the nomogram is based is:

$$D = \frac{2\,H\,[m^{3/2} - (m-1)^{3/2}]}{3\,n^{1/2}}$$

As an example of use of the nomogram, assume height of a triangular pressure diagram to be 30 ft (H = 30). Assume three frames for the first trial (n = 3).

To find the depth of the second frame (m = 2) draw a straight line from n = 3 on the top scale to H = 30 on the bottom scale, cutting the diagonal at the point P. Draw a straight line from m = 2 on the left-hand scale, passing through P and read off D, the depth of the frame, on the right-hand scale.

Its value, to the nearest 3 in., is 21 ft. The first and third frames would be located in the same way, except that m = 1 and 3, respectively.

COEFFICIENTS FOR LOCATING STRUTS

Number of struts assumed	Type of Soil	Load per strut (x Hp)	Strut numbered 1	2	3	4	5
3	Sand	0.267	0.227	0.500	0.773	.....	.....
	Clay	0.258	0.265	0.539	0.800	.....	.....
4	Sand	0.200	0.192	0.400	0.600	0.808	.....
	Clay	0.194	0.227	0.441	0.635	0.833	.....
5	Sand	0.160	0.170	0.340	0.500	0.660	0.830
	Clay	0.155	0.203	0.383	0.538	0.693	0.853

• **Case 2**—This assumes a triangular pressure diagram and a frame at depth of zero pressure taking one-third of the load in each of the remaining, equally-loaded frames below it.

When a collision against the cofferdam is a possibility, a top frame should be provided. It should be of the same dimensions as the others but for safety should be assumed to take only a fraction of the load in each of the others. In the nomogram for case 2 the fraction has been taken as one-third—a reasonable value sometimes used in design.

In addition to the symbols used in the first nomogram, the symbol a in the second is the fraction of the load in each lower frame taken in the top one (one-third in this case).

Analysis gives the expression:

$$D = \frac{2\,H}{3\,(n+a)^{1/2}}\,[(m+a)^{3/2} - (m-1+a)^{3/2}]$$

which can be represented by the nomo-

gram when a has been given a value. (This equation does not apply to the case of m = 1).

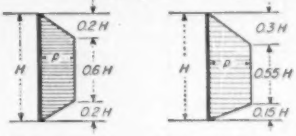
The case 2 nomogram is used in the same way as that for case 1.

• **Trapezoidal pressure diagrams**—Actually, the pressure diagram for a braced vertical wall supporting earth cannot be triangular in most cases. (Reference: "Soil Mechanics in Engineering Practice" by Terzaghi and Peck, p. 345.)

Simple trapezoidal pressure diagrams may be used in design with more confidence than the triangular diagram.

A study of the problem of strut location for trapezoidal diagrams yields the accompanying tabulated coefficients by which the height must be multiplied to give the depths of frames. A nomogram is not convenient for this case.

The assumed pressure diagrams are:



The total load in sand is 0.8 Hp; that for clay is 0.775 Hp (note that p varies). For sand, $p = 0.8\ p_a \cos \delta$, where p_a is the maximum pressure at depth H under active Rankine conditions, and δ is the angle of friction on the wall. For clay, $p = \gamma H - 2\ q_u$, where γ is the unit weight of the clay and q_u is its unconfined compressive strength.

Notes on legal decisions

Summaries of decisions relating to construction work prepared by I. Vernon Werbin, counselor at law and engineer, New York, author of Legal Phases of Construction Contracts (McGraw-Hill Book Co.)

Misrepresentation of Facts

A contractor entered into a contract with the State of New York to do some excavation work in connection with the construction of a canal. The state, with knowledge that the material to be excavated was "a hard compact mass" of the nature of hardpan, represented on the plans upon which the contractor's bid was based that the material consisted of "sand, sand and clay, sand and gravel, red sand, black sand, gravel filling, rock, sand and stone." When the contractor began his operations the material actually encountered was much more expensive to excavate than would have been the materials represented on the plans. Consequently, the contractor brought action to recover the increased cost of doing the work.[1]

The state sought to avoid liability for the increased cost of the work resulting from the misrepresentations by virtue of a provision of the contract that read as follows:

"The contractor agrees that he has satisfied himself by his own investigation and research regarding all the conditions affecting the work to be done and labor and material needed, and that his conclusion to execute this contract is based on such investigation and research, and not on the estimate of the quantities or other information prepared by the state engineer, and that he shall make no claim against the state because any of the estimates, tests or representations of any kind affecting the work made by any officer or agent of the state, may prove to be in any respect erroneous."

The court allowed the contractor a recovery, stating in its opinion: "The state is called upon, in contracting with its citizens, to set a standard which for fairness, justice, equity, honesty, and plain, frank statement of its purpose, without subterfuge or circumlocution, shall be beyond all criticism as being in any way possible of deception."

As to the contract provision under which the state sought to avoid liability for the misrepresentation, the court stated:

"A party to a contract cannot, by misrepresentation of a material fact, induce the other party to the contract to enter into it to his damage, and then protect himself from the legal effect of such misrepresentation by inserting in the contract a clause to the effect that he is not to be held liable for the misrepresentation which induced the other party to enter into the contract. The effect of misrepresentation and fraud cannot be thus easily avoided. If it could be, the implied covenant of good faith and fair dealing existing in every contract would cease to exist.

"The principle that a party to a contract cannot shield himself from his misrepresentations in inducing the other party to enter into it, by inserting a clause like the clause in question, has been enforced in this state and in other jurisdictions in actions between individuals and between individuals and the state and municipalities."

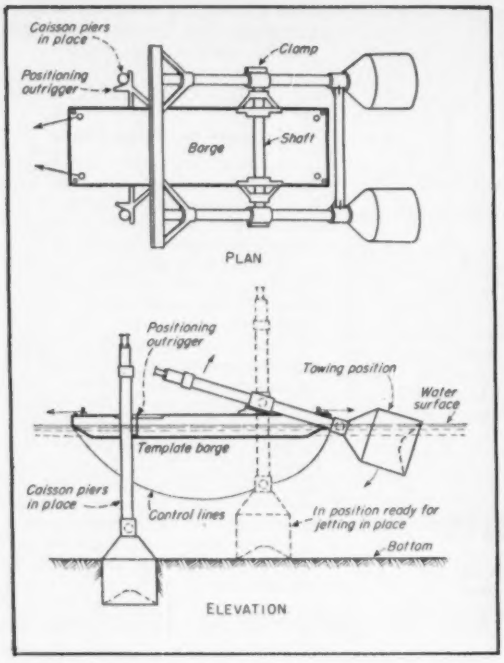
(1) Jackson v State of New York, 210 App. Div. 115, 205 N.Y.S. 658. Affirmed 241 N.Y. 563.

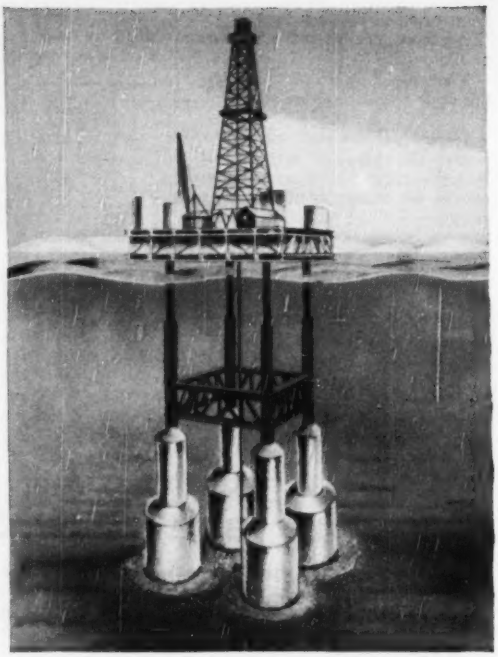
Limits on Extra Work

The New York Court of Appeals in its opinion in a case[1] where the question involved was the right of the contractor to recover extra compensation when ordered by the city's engineer to do work which the contractor considers outside of the contract, stated: "These considerations seem to suggest the general rule that where the municipal representative, without collusion and against the contractor's opposition, requires the latter to do something as covered by his contract, and the question whether the thing required is embraced within the contract is fairly debatable, and its determination surrounded by doubt, the contractor may comply with the demand under protest and subsequently recover damages, even if it turns out that he was right and that the thing was not covered by his contract; and, on the other hand, if the thing required is clearly beyond the limits of the contract, the contractor may not, even under protest, do it and subsequently recover damages. While this rule is only a general one, and may not be determinative of every conceivable case, it seems to furnish a test by which to decide phases of the question which will ordinarily present themselves. * * *."

In another case[2] where the contractor sought to avoid the contract requirement of a written order for extra work by claiming that the work he was ordered to do was work not called for by the contract, the court stated: "It is contended, however, by the plaintiff, [the contractor] that this branch of the work in question was not 'extra work' in the sense of the contract provisions relating to written orders, but falls within the recognized exception that, where a contractor is directed by the engineer to do work already done properly, he may under protest comply with the directions of the engineer and recover thereafter the reasonable value of the work on the theory of breach of contract. * * * * * * That this exception to the general rule may apply, it is necessary that there should be fair room for debate as to whether the directions of the engineer were or were not justified by the contract provisions. Where such directions are unquestionably beyond the contract requirements, then the exception does not apply."

(1) Borough Construction Co. v City of New York, 200 N.Y. 149, 93 N.E. 480.
(2) Molloy v Village of Briarcliff Manor, 145 App. Div. 483, 129 N.Y.S. 929.





DEEP WATER PLATFORM supported on caisson-pier bents involving two or more piers are to be built by new procedures.

Caisson piers designed for offshore oil drill platforms

Carl A. Trexel
Executive Manager,
International Marine Platform Constructors
San Francisco, Calif.

NEW EQUIPMENT AND PROCEDURES have been developed for placing caisson piers in water depths from 50 to 300 ft. The method was developed and patented for the construction of off-shore marine platforms for oil drilling in deep water, but can be applied to other engineering structures.

No drilling platforms have been built by this new caisson pier procedure because of the confused tidelands ownership situation. When that clears up—and it should soon—widespread application of these procedures is expected.

Up to now, all platforms built in the Gulf of Mexico for oil drilling have been supported on piles driven to required bearing values. A pile type of platform is required where there are great depths of silt or other soft material, as is the case near the Mississippi Delta. However, where soil bearing can be developed within a reasonable depth, a caisson pier type of platform designed for soil bearing has an advantage from a cost standpoint.

The caisson pier platform would be the preferred type in water deeper than 50 or 60 ft—the economic limit for piling. The following procedures are applicable to water depths up to 100 ft. With modified design (more lateral bracing) and procedures, such caisson piers can be placed in water up to 300 ft. in depth.

• **Large bases are stable**—The essential elements of the caisson piers are relatively large bases for stability, and relatively small pier columns to present a minimum obstruction to wave forces.

Bases are usually of concrete and compartmented for control in sinkng. The columns are steel, or in some cases —where fire protection is important— of prestressed concrete or concrete with a steel liner. The cone-shaped transition between the base and column is normally of concrete.

For water depths from 60 to 100 ft the diameter of bases would be of the order of 25 ft, and the height of bases variable, dependent in part upon the depth of silt cover over suitable foundation material. The columns vary from 48 to 60 in. dia. and from ¾ to 1 in. in thickness. A large diameter pipe (12 to 16 in.) through the center of the caisson pier column serves as a means of ejecting unsuitable foundation material pumped from under the caisson base; it also serves as a means of placing gravel and a plug of tremie concrete in this same space when cleaned out. Water pipes for jetting and air pipes for ejecting water from the caisson compartments during sinking and raising operations are also run down through the column.

For water depths not to exceed 100 ft, required bracing to resist winds of 125 mph and waves 32 ft high is provided in above-water portal-type bracing. No under-water bracing is required except the strut near the bottom.

Required soil bearing values are of modest proportions, not exceeding 1 ton per sq ft for all vertical loads and not exceeding 2 tons per sq ft including the vertical components from horizontal wind and wave forces, and earthquake where applicable.

• **Quick construction needed**—Erection of offshore platforms under the unpredictable and sometimes very hazardous weather conditions requires

that on-site construction time be held to a minimum. Caisson piers would be constructed at a convenient waterfront construction yard. After launching, they would be assembled as a two-or three-pier, braced-frame bent with positive buoyancy and float. Then with the upper part of the braced bent supported on a barge and the base sections afloat, the bents would be towed out to the platform site.

At the site, the base sections would be gradually filled with predetermined amounts of water, causing them to sink and rotate and causing the bent to assume a vertical position. The column sections would then be permitted to slide through and flooding resumed until the bases rest on or in the bottom.

To facilitate sinking of the caisson bases through silt or other unsuitable material to a firm foundation, water jets are supplied. One set, staggered in two rows around the outside vertical surfaces of the bases at 1/3 and 2/3 height, is for lubrication of the caisson walls during sinking operations. These jets are most effective and trouble free if positioned at right angles to the wall surfaces.

If the caisson base is to be sunk through considerable depths of material, compressed air is introduced at the water jet nozzle to assist further in reducing skin friction. A second set of jet nozzles is located around the periphery and inside the cutting edge of the caisson base to flush the soft materials to a pump suction at the center of the base.

After the caisson pier bases have been seated on firm material in a plumb position in both planes and at the required elevation, the cone-shaped cavity under the base would be filled with rammed gravel and a tremie-placed concrete plug.

Positioning the second and subsequent frames accurately with respect to the frame or frames already in place now becomes relatively easy. The barge with the next frame is moved to, and held in contact with, the columns of the frames already in place, by means of positionng outriggers. When this frame has been sunk in greater water depths, to avoid interference, the frame to be placed is rotated before the barge is moved into contact with the frames already in place. Bracing girders are placed, connecting the two frames. The template barge is disengaged, and any additional bents are placed in the same manner.

Sharp rise in road expenditures in the post-war period

REVISED ESTIMATE of the total expenditures on highways in the years 1945-1949 show a rise from $1,429 million in 1945 to $3,695 in 1949, according to a new report entitled "Highway Finance, 1945-1949" issued by the Bureau of Public Roads, Washington, D. C. These figures include new construction, maintenance, administration, bond financing and policing on state highways, country roads and city streets, also federal expenditures on roads in national forests and parks and in Indian reservations.

Details of these expenditures are given in the accompanying table, which is reproduced from the BPR report. The totals for 1948 and 1949 are the highest on record.

Commenting on these figures, statisticians of the Bureau of Public Roads state that the amounts given for 1945 through 1948 are considered final. The 1949 figures, however, are estimates subject to revision, but the possible changes will not be significant.

The report also states that 1945 was essentially a war year in which highway income was still affected by wartime controls and in which expenditures were limited by continuing shortages of equipment, materials and manpower. Actually, the report adds, the post-war road program did not get fully under way until 1947. By that time total expenditures were nearing the three billion mark annually.

However, this sharp rise in dollar expenditures does not represent a corresponding rise in accomplishment, the report concludes, due to steadily rising costs per unit of work. Although no indexes can be expected to show the effect of rising costs accurately, the bureau estimates that capital outlays in 1949 did not accomplish as much as those made in 1945.

Estimates of revenues received by the federal, state and local governments for the same five years total to $1,849 million for 1945; $2,451 for 1946; $2,774 for 1947; $3,156 for 1948; and $3,491 million for 1949.

ESTIMATES OF EXPENDITURES FOR HIGHWAY AND STREET PURPOSES BY FEDERAL, STATE, AND LOCAL GOVERNMENTS IN CONTINENTAL UNITED STATES, 1945-1949 1/

BUREAU OF PUBLIC ROADS — TABLE HF-2 JUNE 1950

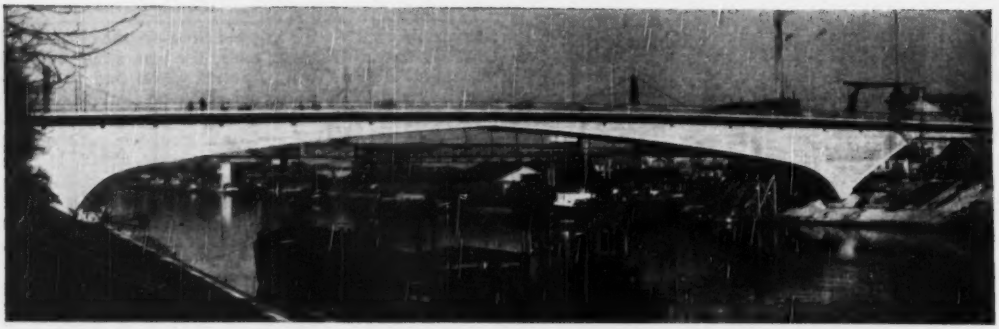
EXPENDED ON —	1945	1946	1947	1948	1949
	MILLION DOLLARS	MILLION DOLLARS	MILLION DOLLARS	MILLION DOLLARS	MILLION DOLLARS
STATE HIGHWAYS: 2/					
CAPITAL OUTLAY	213	519	899	1,166	1,357
MAINTENANCE	292	329	378	468	480
ADMINISTRATION 3/	51	90	133	108	150
HIGHWAY POLICE	28	41	46	63	67
INTEREST	58	54	50	52	48
TOTAL	643	1,033	1,506	1,853	2,082
COUNTY AND LOCAL RURAL ROADS:					
CAPITAL OUTLAY	83	169	254	313	339
MAINTENANCE	313	377	427	477	510
ADMINISTRATION 3/	20	25	31	42	43
INTEREST	32	32	31	31	31
TOTAL	448	597	743	863	923
STREETS IN INCORPORATED AND OTHER URBAN PLACES:					
CAPITAL OUTLAY	52	116	203	234	266
MAINTENANCE	200	227	269	297	311
ADMINISTRATION 3/	24	24	28	31	33
INTEREST	44	43	42	42	41
TOTAL	327	410	542	604	651
FEDERAL EXPENDITURES NOT CLASSIFIED BY SYSTEM 4/	11	26	40	38	59
ALL ROADS AND STREETS:					
CAPITAL OUTLAY	366	824	1,356	1,751	2,001
MAINTENANCE	802	933	1,074	1,242	1,301
ADMINISTRATION 3/	99	139	192	177	206
HIGHWAY POLICE	28	41	46	63	67
INTEREST	134	129	123	125	120
GRAND TOTAL	1,429	2,066	2,831	3,358	3,695

1/ FEDERAL AND STATE DATA ARE FOR CALENDAR YEAR; COUNTY AND LOCAL DATA ARE FOR VARYING FISCAL YEARS, AS REPORTED.

2/ INCLUDES EXPENDITURES BY STATES ON TRANSCITY CONNECTIONS OF STATE HIGHWAYS.

3/ INCLUDES ENGINEERING AND EQUIPMENT COSTS NOT CHARGED TO CAPITAL OUTLAY AND MAINTENANCE, AND OTHER MISCELLANEOUS EXPENDITURES.

4/ INCLUDES FUNDS OF FOREST SERVICE AND NATIONAL PARK SERVICE EXPENDED BY BUREAU OF PUBLIC ROADS AS WELL AS FUNDS EXPENDED DIRECTLY BY THE FOREST AND PARK SERVICES. THESE EXPENDITURES WERE PRINCIPALLY FOR CONSTRUCTION AND ARE INCLUDED AS SUCH IN THE TOTALS.



LONGEST PRESTRESSED-CONCRETE SPAN in the world carries highway traffic over the Neckar Canal in Germany.

Prestressed concrete arch spans 353 ft

August E. Komendant
Consulting Engineer
New York, N. Y.

THE WORLD'S longest prestressed-concrete span was opened to traffic last May. The main span of a 570-ft highway bridge crossing the Neckar Canal in the harbor of Heilbronn, Germany, it consists of two three-hinged arches 353 ft long.

The bridge carries a 36-ft roadway and two 5-ft 9-in. sidewalks. It was designed for a live load of 70 tons in each lane, plus a 1.2-ton per lin ft load for a two-way streetcar track in the middle of the roadway.

• **Prestressing technique** – The main arches are hollow boxes, with an 11.5-ft wide, simply supported slab between them. They have a rise of 35.6 ft, varying in depth from 36 ft at the abutment to 6.22 ft at the crown.

Each arch half on either side of the crown hinge was treated as a cantilever and prestressed with 13 wire ropes, 1.5 in. in diameter at the deck slab level. The ropes were placed in grooves along the sides of girder and turned back 180 deg around horizontal semicircular discs at intervals along the lengths of the arch halves.

The anchorages were at the abutment ends. There, both ends of the wire ropes were wedged in steel funnels and fastened in groups of two or three in steel frames. Lengths of the ropes were adjusted to permit them to be tensioned simultaneously.

Hydraulic jacks of 300-ton capacity, inserted between the frames and the girder ends, applied the prestress, tensioning the ropes to 126,000 psi. Then, the ropes and the frames were encased in concrete, after which the jacks became redundant.

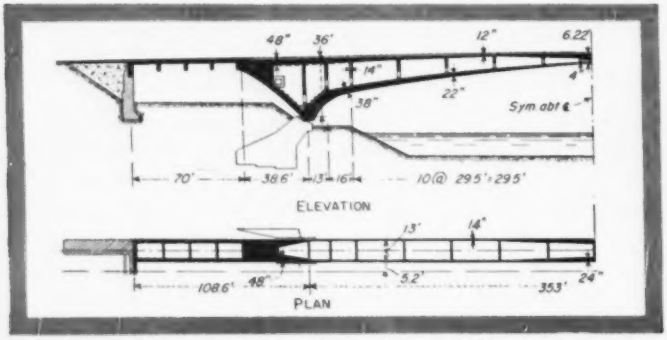
• **High-strength materials** – Ultimate strength of the wire was 235,000 psi, and the technical creep limit was about 65% of the ultimate strength. However, for safety against possible creep, the ropes were overstressed 12,000 psi for six hours. The final stress in the wire ropes after the shrinkage and plastic flow of concrete had taken place was computed to be 104,000 psi. Thus, the loss of stress in the steel was 22,000 psi.

Ultimate compressive strength of the concrete was 6,000 psi. Design stresses were 1,400 psi for compression and 140 psi for tension.

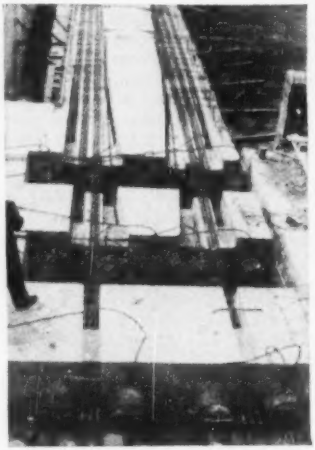
• **Less steel and concrete**—Materials required for each arch per sq ft of the 353-ft main span was computed to be 3.35 lb of wire rope, 17.5 lb of steel, 1.0 lb. of anchors, 4.75 cu ft concrete.

The bridge was designed and constructed by Wayss and Freytag. It replaced a reinforced concrete arch bridge that was blown up by retreating German troops in 1945. Since both bridges were designed for the same live load and since they have approximately the same statical system and span, they provide comparative data for prestressed-concrete and conventional reinforced concrete designs:

Computations show that although the new bridge is 7.3 ft wider than the old one, the total saving of steel was 40%, of concrete 16% and of manhours 15%.



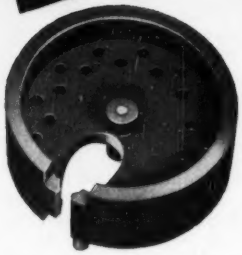
HOLLOW GIRDER CONSTRUCTION is used for the 3-hinged arch main span. Each half of the arch was treated as a cantilever.



WIRE ROPES, 1.5 in. in diameter anchored at abutments applied the prestress.

THE *EXTRA* VALUE IN ROCKWELL EMPIRE METERS

A BALANCED *OSCILLATING PISTON*



Empire meters alone have the design advantage of a *balanced* oscillating piston. This *exclusive* measuring element *glides* with a circular motion between the mirror smooth surfaces of a snap-joint chamber. It is built with a *center web* both for strength and to *balance* water pressure from above and below. Hence the feather weight Empire piston practically floats. Users report Empire meters measure both large and small flows with *greater accuracy* . . . and *for longer periods* without attention. They earn top revenue.

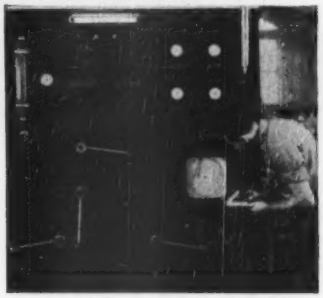
Write for bulletin.

Rockwell

THE ONLY COMPLETE LINE OF WATER METERS

ROCKWELL MANUFACTURING COMPANY

NEW KIND OF TEST PILOT FOUND IN METER FACTORY



Test pilot recording readings at panel board of electrically controlled test plant

A test pilot who never leaves the ground has been found in Brooklyn. He is the one man control in charge of a new, electrically operated plant that tests water meters for accuracy before they are shipped. He simply turns levers, adjust dials and, presto, the plant is ready to test new meters in batteries up to 240 at a time in four test lanes.

This new meter tester is unusual in that it can be adjusted to duplicate actual field operating conditions. For

Overall view of new meter testing facilities

example, meters going to warm climates can be tested for accuracy and response at the same water temperatures they will encounter in service. Officials of Rockwell Manufacturing Company in whose meter factory the new tester is installed hail the development as a notable advance in the art of measurement accuracy. In equipment formerly available, meters were tested under average water conditions for the entire country. Meters so tested frequently performed differently when put in service. The new, robot controlled test plant is expected to eliminate this difficulty. It is a custom made job designed by Rockwell engineers to meet their exacting requirements for accuracy.

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10 to 15 lbs.

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Have greater load capacity

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Symons Column Clamps Save Money on Every Job

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Only two units—both alike, no loose parts

★ SIMPLE TO APPLY
Require only a hammer, and are completely adjustable

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READER COMMENT

Biggest Midwest Harbor

Sir: We must take respectful exception to the statement that "If and when the St. Lawrence seaway allows ocean vessels to enter the Great Lakes, this port (Gary, Ind.) would be the only one capable of handling them." (ENR Oct. 5, 1950, p. 17).

Unlike the Gary port, which yet has to be modernized, the Port of Milwaukee already has in operation modern, deep-draft outer harbor facilities intended not only to accommodate present lake and ocean shipping, but designed very specifically for future deep-draft seaway traffic. We now have in operation on the Milwaukee outer harbor three modern port facilities, designed with a full appreciation of future seaway shipping requirements, including a cargo terminal and 1000 and 1100-ft piers.

We have just placed in service the finest heavy-lift crane on the Great Lakes, with a lifting capacity of 90 tons, to accommodate the demands of present ocean shipping and future requirements when the seaway is opened. During the current shipping season, the Port of Milwaukee will have more than 80 ocean sailings to the Caribbean area and to all of the principal ports of Europe.

And to accommodate present demands and future seaway requirements, we are currently carrying out a million dollar improvement program.

The item in your October 5 issue becomes more ironical when I advise you that the Indiana State Board of Harbors and Terminals, which is developing plans for the future Burns Harbor near Gary, has practically beaten a bath to the door of this office, securing information concerning the Milwaukee plan and our present and future development.

Merely as a detail, to illustrate how we have projected our thinking toward the seaway potential, our outer harbor facilities are constructed with steel sheeting bulkheads from 50 to 65 ft in length. Present project depth at these facilities is 25 ft, but the slips serving our outer harbor docks can readily be dredged to 27 or 30 ft when deep-draft shipping enters the Great Lakes through the St. Lawrence.

The Milwaukee outer harbor facilities are currently handling approximately two million tons of cargo per year, representing about one-fourth of our annual 8¼ to 9 million ton volume of commerce through the entire harbor. We mention this merely as evidence that these facilities are receiving very practical and intensive present-day use, which is fairly good evidence that they will be used much more intensively when the seaway arrives.

It is no exaggeration to say that the Port of Milwaukee is the only port on the Great Lakes really prepared for the seaway. More than two miles of Milwaukee's lake frontage is reserved for public harbor development; modern port facilities are in operation; the most modern handling equipment is available; a port authority capable of ready expansion has been effectively operating for more than thirty years; and a flexible plan of development is in effect incorporating provision for new port facilities, excellent highway access, and adequate rail facilities.

H. C. Brockel
Municipal Port Director
Board of Harbor Commissioners,
Milwaukee, Wis.

Vague specs are costly

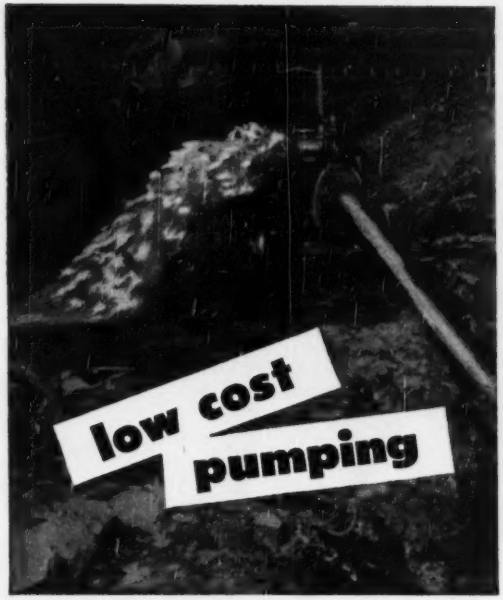
Sir: We believe some publicity should be given the handling of bids by the various New York City departments. For example, the Board of Education received no bids recently on a proposal for some additions to Public School 199 in Brooklyn. This was the second time this project was out for bid, but because of the vague wording of the specifications as to when the buildings to be demolished were to be vacated, all the general contractors refused to bid. Also, during the past four or five years, the Department of Public Works has had projects bid and rebid twice.

None of the jobs ever come out for bids without numerous addenda. It is our belief that the issuance of addenda, changing or adding to the specifications a day or two prior to the bid opening, means both a burden and added expense. Certain portions of the work must then be refigured, and the prices of various subcontractors may, and usually are, affected.

In most cases it would seem that our public works could be properly thought out and designed before they are sent out for bidding. It can always be said "You do not have to bid these jobs," but after all, we are taxpayers, too, and help pay the costs of all these various departments.

Our method of bidding jobs in this country is very expensive in any event. No one seems to consider the poor general contractor.

William Gardner
Gardner Construction Corp.
New York, N. Y.



4 days' work in 3
with JAEGER AIR-PLUS

250 ft. of 100 lb. air behind a 3½" drill—drills as many feet in 3 days as 210 ft. of air will drill in 4.

drills 35% more footage per hour

75 - 125 - 185 - 250 - 365 - 600 ft.—these "new standard" sizes give you more air per dollar, more production per man

Tools that starve for air when they're hooked to "old standard" size compressors hit hard and fast and profitably with Jaeger's 15% to 25% more air.

From the Model 75, that runs a heavy breaker at full pressure, to the Model 600, that holds full pressure in two 4" wagon drills plus an auxiliary drill, Jaeger "Air-Plus" capacity increases production up to 30% to 40% with the same men and tools. If you are interested in "air-power" rather than "iron," increased production without increased payroll, and full profit instead of "break even"—

see your Jaeger distributor, or send for Catalog JC-8.

JAEGER invites 5-way comparison with any other pumps

1 - Actual priming speed
2 - Vacuum, capacity and pressure
3 - Gallons of water moved per gallon of fuel
4 - Self-cleaning ability
5 - Hours of service per dollar invested

1½" and 2" Aluminum Pumps: 5100 and 9000 gph. Replaceable liners, stainless steel shell fittings.

Heavy Duty 2", 3", and 4" Portables: Also lighter utility models.

Slow-Speed, Long-Life 6", 8", 10" Pumps—Full capacity at 1450 rpm instead of usual 1800, for all dewatering service.

2" to 8" Pressure Pumps for jetting and supply pumping at higher heads.

See your Jaeger distributor or send for complete Catalog P-10.

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Leading distributors in 130 cities of the United States and Canada sell, rent and service Jaeger Engineered Equipment

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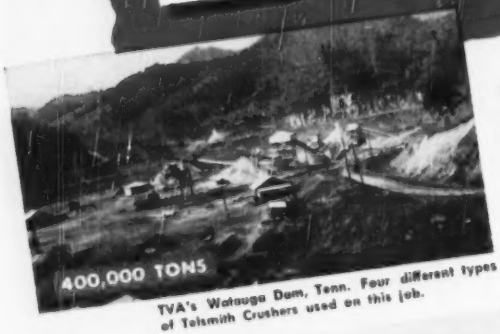
BITUMINOUS PAVERS • CONCRETE SPREADERS AND FINISHERS

TELSMITH EQUIPMENT FOR DAMS



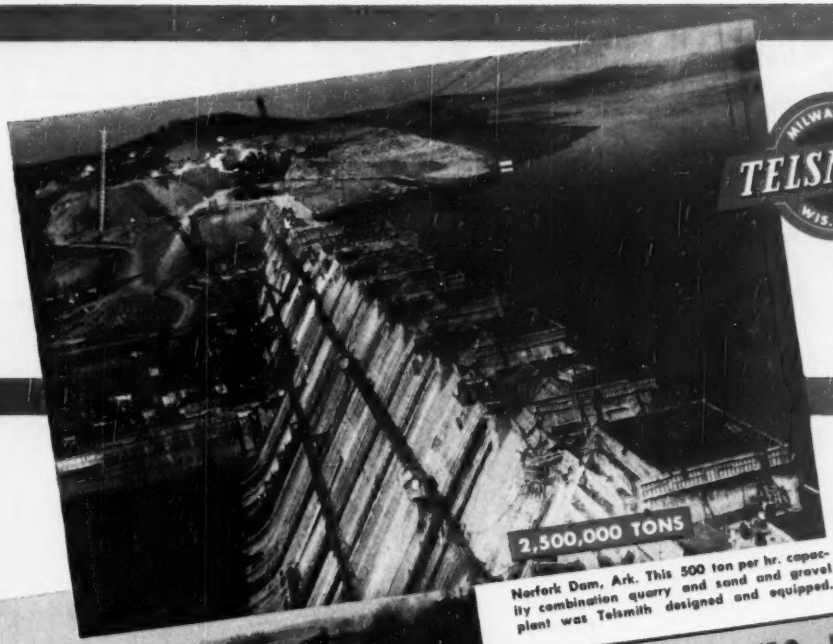
TVA's Watauga Dam, Tenn. Four different types of Telsmith Crushers used on this job.

● Huge dam projects and Telsmith Aggregate Plants go together. Many dam builders call in Telsmith engineers right at the start—for consultation as to the proper plant layout and the right equipment to use. Then Telsmith makes the detailed drawings for the erection of the plant and furnishes most of the machinery. Telsmith designed plants have proven their efficiency on many large projects and Telsmith equipment has a world-wide reputation for the production of low-cost aggregate. The ruggedness of Telsmith equipment is strikingly demonstrated by long life in severest service, on successive projects. After producing 1,500,000 tons of aggregate at Center Hill Dam, the same Telsmith equipment is now turning out about the same amount of aggregate at Buggs Island Dam.

Center Hill Dam, Tenn. Telsmith designed complete crushing-screening plant; and furnished most of the equipment.

Buggs Island Dam, Va. This Telsmith crushing plant also produced the aggregate for Center Hill Dam.

Save **TIME and MONEY** **Consult Telsmith Engineers—Ask for Bulletins 266 and 271**



Norfork Dam, Ark. This 500 ton per hr. capacity combination quarry and sand and gravel plant was Telsmith designed and equipped.

Philpott Dam, Va. Here, too, the crushing-screening equipment is Telsmith.

Mount Morris, Dam, N. Y. The 300-350 tons per hour rock crushing plant is Telsmith designed and equipped.

OTHER DAMS BUILT WITH TELSMITH EQUIPMENT

- Alatoona Dam, Georgia
- Ariel Dam, Ariel, Wash.
- Boysen Dam, Shoshoni, Wyo.
- Carpenter Dam, Arkansas
- Cascade Dam, Washington
- Clark Hill Dam, Augusta, Ga.
- Conowingo Dam, Conowingo, Md.
- Dale Hollow Dam, Tennessee
- Davis Dam, Nevada
- El Presidente Dam, Mexico
- Fort Gibson Dam, Oklahoma
- Grand Coulee Dam, Washington
- Kortes Dam, Wyoming
- Morony Dam, Montana
- South Holston Dam, Tennessee

MS-11

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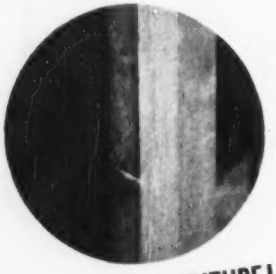
Clyde Eqpt. Co., Portland 9, Ore., & Seattle 4, Wash. • Mines Eng. & Eqpt. Co., San Francisco 4, Calif. • Interstate Equipment Co., Statesville, N. C.

Rish Eqpt. Co., Charleston 22, & Clarksburg, W. Va.—Roanoke 7, & Richmond 10, Va. • Wilson-Weesner-Wilkinson Co., Knoxville 8, & Nashville 6, Tenn.

FROM THIS SLUMP...

In the heavily reinforced concrete specified for the Veterans Administration Hospital, Boston, Darex AEA permits the use of an unusually low slump of only 3½" maximum. Darex AEA makes concrete flow into forms and around steel more easily, without excess water. Darex AEA concrete is more placeable.

A Darex AEA concrete column with its plywood form removed! Note the detailed reproduction of the form, even to the knot hole and nail heads. On-the-job proof (Boston V.A. Hospital) of the remarkable placeability of Darex AEA low-slump concrete.



THIS SURFACE TEXTURE!

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Darex AEA is the only catalyzed air entraining agent specifically formulated for making air entrained concrete.

Darex AEA is in use everywhere on every type of concrete construction... and in ready mix and concrete products plants using every known type of aggregate.

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Chicago 38 Montreal 32

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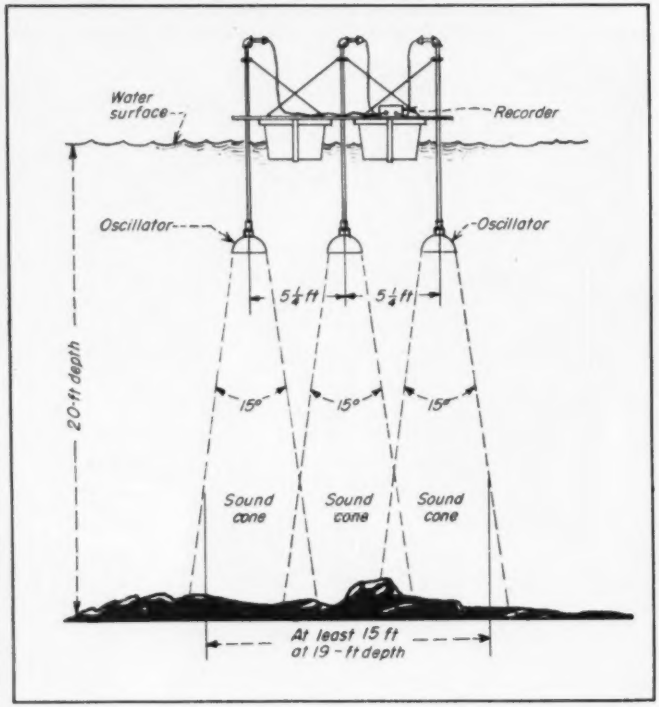
FIELD AND OFFICE



SWEEPING DEVICE has three oscillators suspended from two flat-bottom skiffs.

Supersonic sound waves sweep Chicago harbors

Sound waves with supersonic frequency are being used to locate under water harbor obstacles in the Chicago area. Advantages claimed by the Corps of Engineers for the supersonic method of sweeping over the conventional bar-sweep system are these: It requires less time and fewer men, assures greater accuracy and provides an automatic record of the sweeping. This method of keeping channels safe for navigation was devised by Ernest Van Meer, engineer in the Chicago District of the Corps.

In field trials of supersonic sweeping in Chicago harbors, three outboard oscillator units were used simultaneously in conjunction with a single recorder. The three oscillator units were mounted abreast of each other on a catamaran, formed of two 16-ft flat-bottomed skiffs. One unit was suspended between the two skiffs; the others hung from their outer sides. All were suspended to a uniform depth.

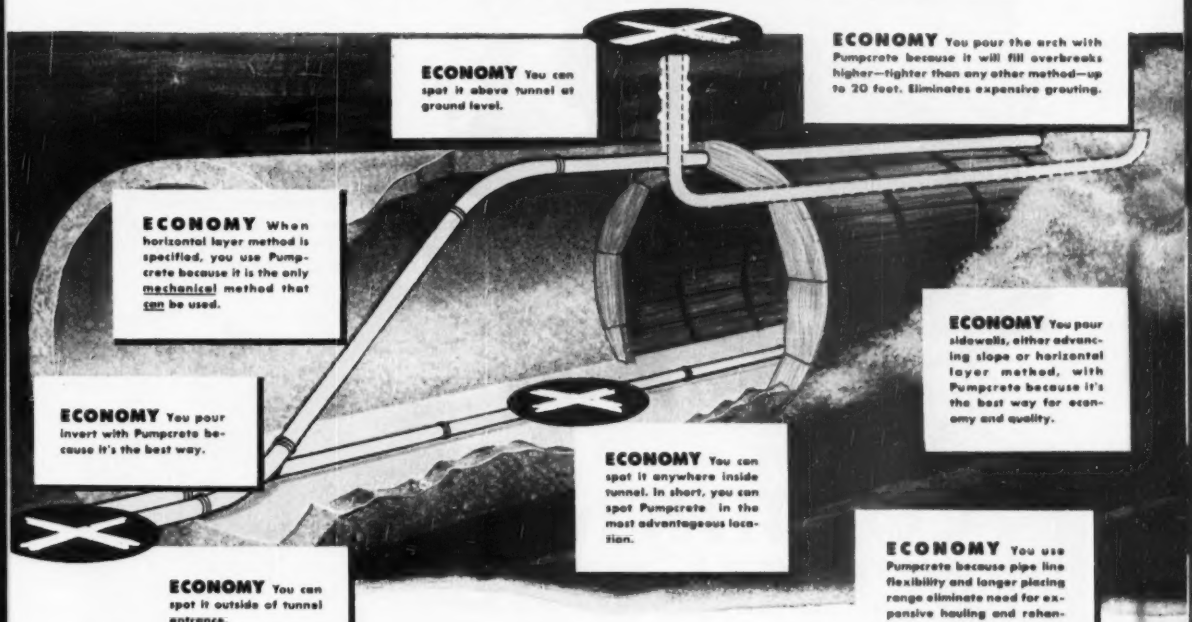
Depths of channels in the Chicago district range from 18 to 28 ft and the effective cone of sound projection and reception of the outboard oscillators is about 15 deg. So, with the units spaced on 5.25-ft centers, sound cones overlap at a depth of about 19 ft, giving coverage of a path at least 15 ft wide. For lesser depths the oscillators may be mounted closer together.

An electrical impulse discharged by the recorder is carried to the three transmitting oscillators connected in parallel so that each of the three transmitting oscillators projects a sound impulse at the same instant. The three receiving oscillators are likewise connected in parallel with the recorder. Since the shallowest point within the three sound cones reflects the first echo, that echo is first received and printed by the recorder. Later echoes are absorbed in the width of the record band. To furnish a check on complete coverage of the bottom, the sweeping courses are laid out to provide for an overlap of about 50%. This overlapped sweeping can be done speedily since the sweeping equipment can be operated at about 8 mph.

(*Continued on page 56*)

follow the spots...

FOR LOW COST, HIGH QUALITY TUNNEL LINING WITH PUMPCRETE!®



ECONOMY You can spot it above tunnel at ground level.

ECONOMY You pour the arch with Pumpcrete because it will fill overbreaks higher—tighter than any other method—up to 20 feet. Eliminates expensive grouting.

ECONOMY When horizontal layer method is specified, you use Pumpcrete because it is the only mechanical method that can be used.

ECONOMY You pour sidewalls, either advancing slope or horizontal layer method, with Pumpcrete because it's the best way for economy and quality.

ECONOMY You pour invert with Pumpcrete because it's the best way.

ECONOMY You can spot it anywhere inside tunnel. In short, you can spot Pumpcrete in the most advantageous location.

ECONOMY You can spot it outside of tunnel entrance.

ECONOMY You use Pumpcrete because pipe line flexibility and longer placing range eliminate need for expensive hauling and rehandling equipment—reduce labor requirements.

PUMPCRETE MEANS QUALITY— ASSURES A BETTER STRUCTURE . . .

QUALITY 1—Pumpcrete does not segregate concrete.

QUALITY 2—Pumpcrete is the only method that places sidewall concrete in horizontal layers without chuting or dropping of concrete.

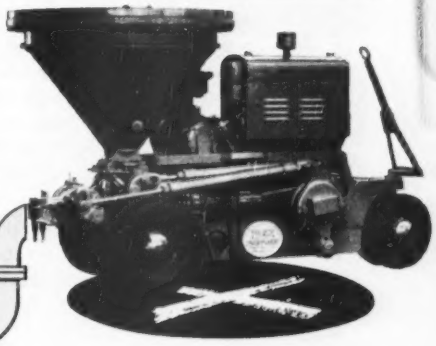
QUALITY 3—Pumpcrete will handle stiffer mixes.

QUALITY 4—Pumpcrete reduces loss of slump between pump and point of placement.

QUALITY 5—Pumpcrete will fill overbreaks higher—tighter than any other method—up to 20 feet.

QUALITY 6—Pumpcrete assures a continuous flow of concrete to the forms . . . thereby eliminating many cold joints and related imperfections.

QUALITY 7—Pumpcrete is the only method that assures a tightly lined tunnel without need for grouting.



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BEFORE YOU LINE YOUR TUNNEL, SAVE MONEY BY ASKING TO SEE THE CHAIN BELT COMPANY'S EXCLUSIVE NEW FILM ON UNDERGROUND CONCRETE PLACEMENT.

CHAIN BELT COMPANY, 1633 W. Bruce St., Milwaukee 4, Wis.

CHAIN BELT COMPANY REX CONSTRUCTION MACHINERY

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...About CONTINENTAL RED SEAL POWER

When you're in the market for internal combustion power, look into the experience of other users, checking as near the actual job level as you can. Ask the man who runs the machine, in any of a dozen fields, and the answer will be pretty much the same: Continental Red Seals deliver dependable, low-cost power. They require little attention. They're mighty easy on fuel. This uniformly high esteem results from *specialization*. There's a Continental Red Seal model engineered to meet the needs of virtually every job, in industry, construction, transportation, and on the farm. There's a Red Seal engine or power unit built expressly for YOUR application. Get it, and you'll have the one best power source for your job, because it's built to do one thing and do it well.

FACTORY-AUTHORIZED SERVICE AND GENUINE CONTINENTAL RED SEAL PARTS AVAILABLE FROM COAST TO COAST

Continental Motors Corporation
MUSKEGON, MICHIGAN

The record is subject to slight correction where sound path varies from the vertical. With the equipment arranged as described above (maximum variation about 7½ degrees from the vertical) maximum error in the recorded depth is less than 1%.

Previously, harbors in the Chicago District were swept by suspending a long bar, or series of bars, under a boat and running over the channel course. If the bar hit an obstruction, the boat crew would mark the location, determine the height and extent of the obstacle and record the obstruction. Often it was necessary to resweep an area several times at successive depths for an accurate record.

The Corps of Engineers estimates that the new process will save at least $5,000 per year in the cost of maintaining harbors in the Chicago area and proportionate amounts at other harbors where the method is adopted. —James E. Tripp, Chicago District, Corps of Engineers.

"Foolproof" blasting machine

Operator skill (or its lack) is said to have little effect on a new blasting machine devised by demolitions experts at the Engineer Research & Development Laboratories, Fort Belvoir, Va. Providing a high degree of reliability and sureness of functioning, the new M-2 50-cap blasting machine is undergoing rigid military tests at the Army installation.

Light weight, compactness, and ability to detonate charges under all tactical and climatic conditions varying from minus 65 deg F to plus 125 deg, are a few of the improvements realized. Consisting of a springwound dc generator, the machine is approximately half the bulk and weight of machines presently in use. In addition to being fitted for use in arctic and tropical regions, the M-2 is waterproof and capable of functioning in amphibious operations.

The test model was produced for the Army by the Fidelity Electric Co. of Lancaster, Pa.

Another modern building saves with Reinforced Concrete!

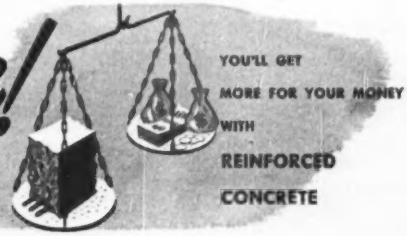
Manhattan House, New York City, owned and managed by New York Life Insurance Co. Associated Architects: Mayer & Whittlesey, and Skidmore, Owings, & Merrill. Structural Engineer: Charles Mayer. General Contractor: Cauldwell Wingate Co.

For this modern apartment building—New York Life Insurance Co.'s Manhattan House—reinforced concrete was chosen for frames and floors, which resulted in appreciably lower framing costs. Note the upper floors. This type of construction permits an important saving in vertical space.

Reinforced concrete construction offers many other advantages. Its monolithic structure is inherently firesafe, as well as highly resistant to wind, shock, and quakes. For your next building, consider reinforced concrete.

CONCRETE REINFORCING STEEL INSTITUTE
38 S. Dearborn Street
Chicago 3, Illinois

Compare!



Take a bow, fellers!

Precision and quality don't grow on trees. But they grow.

At Keuffel & Esser precision and quality are almost a century plant. In other words they have been growing there in fertile soil for exactly 83 years. (K&E was founded in 1867.)

It's mostly a matter of people. Oh, there are machines, too, big ones, little ones—some of them almost human—but it takes people to imagine the machines, and to master them and supplement them.

Precision in the Air

I've been talking about K&E products for a long, long time. Maybe it's time I talked a little about the people behind them.

I've just been through the K&E factory at Hoboken again. I wish you could have been along, because you, as an engineer, would have seen much more than I. But even I could sense the honest craftsmanship and the father-and-son tradition of precision and the zeal for quality in the air.

You just don't get to be that fine in one generation.

There are a number of K&E employees who have been around for about a half a century, and there are some 150 employees who have been there for a quarter of a century or more. This latter bunch of kids, as well as the young sprouts who have been there only 20 or 15 years, have inherited the K&E feeling for doing things the good, old, exciting, honest way.

The first factory built by Keuffel & Esser, in 1880.

But don't get the idea that there is any moss on K&E. An outfit that has thrived this long has to have the knack of remaining perennially young and of keeping ahead of the pack.

"Partners in Creating"

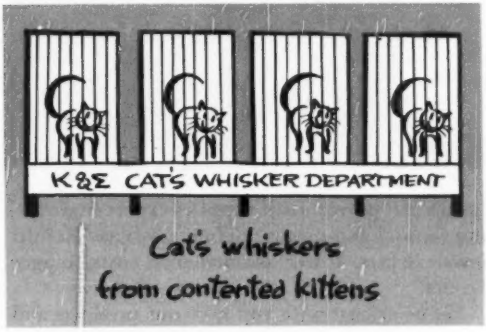
When K&E coined the phrase "Partners in Creating," they of course meant not themselves but their products. And it's true that K&E products have been in with engineers, scientists, draftsmen and architects on the

The K&E trade mark for decades, and the more modern one adopted in recent years.

creation of most of the big man-built wonders of the world for over 4/5 of a century.

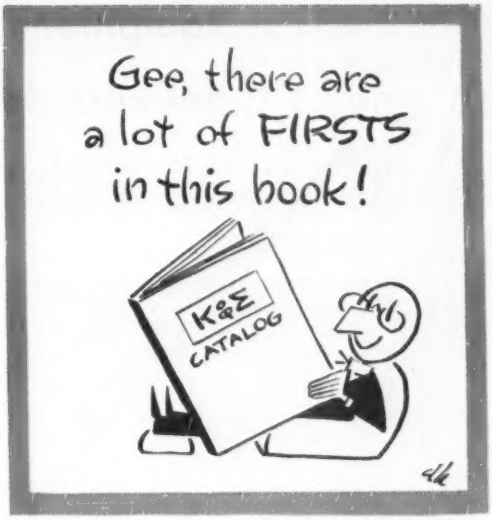
Zippy at 83

K&E have remained alert and alive, as is evidenced by their unending originality and inventiveness. They made America's first slide rules, as far back as 1891. And in both world wars, they did a big development job on optical equipment for our fighting men—on vital things such as periscopes, fire control instruments and height finders. The K&E catalog is full of "firsts"—some of them plenty recent, such as Wyteface* Measuring Tapes and Leroy† Lettering Equipment. No wonder it's the engineers' encyclopedia.



Factories within a Factory

K&E headquarters are a town within a town, many factories within a factory. In one area they're coating miles of papers and cloths. In another they're turning screws so tiny you feel like a hippopotamus if you try to pick one up. Here they're grinding optical lenses.



There they're putting graduations no bigger than a fly's kneecap on scales of some sort. Here they're doing fastidiously fine leather work. There they're reeling off steel measuring tapes by the mile.

K&E was in there sighting,
in World Wars I and II

But wherever you go you are aware of the age-old passion for precision and quality. And I'm not the least bit sorry that today I haven't sold you a single K&E product. I've just tried a little bit to sell you on the people at K&E—and to get you to believe that you can safely make K&E products trusted partners in your own creative work.

K+E
partners
in creating
For 83 years K&E equipment and materials have been partners of the draftsman, engineer and scientist in shaping the modern world.

*Trade Mark
†Trade Mark

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CHICAGO • ST. LOUIS • DETROIT • SAN FRANCISCO
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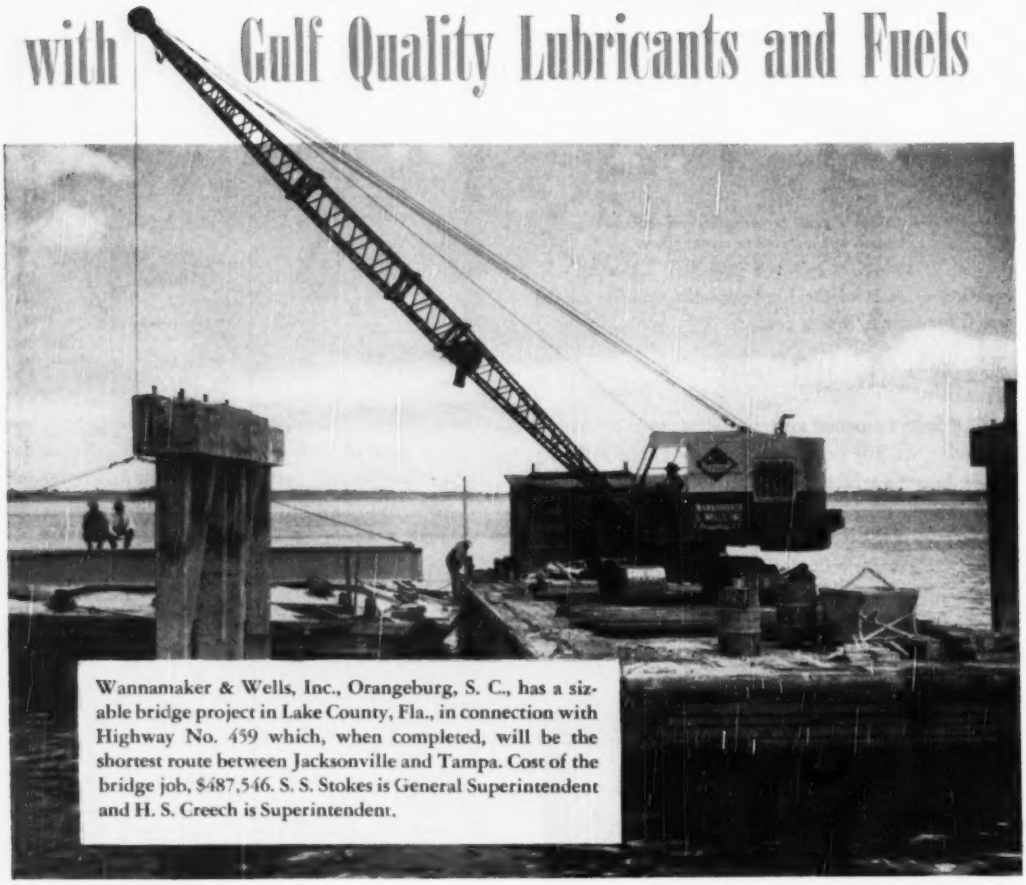
Equipment on Florida Bridge Project delivers dependable performance with Gulf Quality Lubricants and Fuels



Wannamaker & Wells, Inc., Orangeburg, S. C., has a sizable bridge project in Lake County, Fla., in connection with Highway No. 459 which, when completed, will be the shortest route between Jacksonville and Tampa. Cost of the bridge job, $487,546. S. S. Stokes is General Superintendent and H. S. Creech is Superintendent.

ANOTHER big construction project where Gulf quality products and cooperative service are working as a team to help the job roll smoothly and efficiently.

Here are a few of the reasons why so many leading contractors prefer the products identified by the familiar orange disc: Gulf lubricants provide an extra margin of protection. Gulf fuels help to insure full power. Gulf supplies expert engineering counsel and prompt delivery service. Result: fewer delays, lower maintenance costs, bigger profits!

Let us discuss with you how our products and services can help you on your next job. They are available to you through more than 1200 warehouses. Write, wire, or phone today.

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MUNICIPAL AFFAIRS

Water, water everywhere

Big water saving—As a result of a water waste survey by the Pitometer Company, engineers, New York City, the total annual saving to the city of Niagara Falls, N. Y., is $100,000, according to the company's report submitted to City Manager Charles W. Collison. The firm reported that underground leakage located and repaired as result of the survey of the distribution system amounted to 3,339,000 gpd. Loss due to under-registration of industrial water meters was eight percent of the total consumption of the entire system, which represented a loss of revenue of about $80,000 a year, the firm reported. Savings effected by discovery and repair of underground leakages amount to $20,000 a year, based on the cost of production only.

Rate increase—It is expected that water consumers at Dayton, Ohio, will pay higher rates beginning Jan. 1 next, but just how much the increase will be is unknown at this time. The city has had no general water rate increase since 1927. City Manager Russell E. McClure asked administrative officials to report by Dec. 1 on a proposal for new rates. The recommendation will then be submitted to the city commission for action before the first of the coming year.

Water priority—In Milwaukee, Wis., city officials have decided to give newly-annexed areas priority on water department construction dollars in 1951. They thereby chose to delay until 1952 major improvements in the water distribution system within the city. Edward F. Tange, waterworks superintendent, said "We believe it is more important to supply water to homes and industries to which we have promised it than to extend the big feeder main."

Houston wells are adequate—Despite the heavy increase in pumping from wells in and around Houston, Tex., during the last 20 years, with an accompanying drop in artesian pressure, the underground water supply has not been seriously overdrawn, Secretary of Interior Oscar L. Chapman reports. This fact, together with data indicating that additional supplies of fresh water can be developed to the north and east of the city, is contained in a report prepared cooperatively by the Geological Survey, United States Department of the Interior; the Texas State Board of Water Engineers; and the city of Houston.

At present Houston draws all its water for domestic use from wells, and in addition nearly all that is needed for industrial purposes and a large part of what is used for irrigating rice fields in the vicinity. These wells range from 450 to 2,000 ft in depth. Withdrawals in 1949 averaged about 250,000,000 gpd. An average of 150,000,000 gpd was pumped in the Houston-Pasadena area alone, which was about three times the quantity pumped in 1930 and twice the quantity pumped in 1941.

Secretary Chapman said the present water survey was necessary because of the widespread development of industry and irrigation in the area, as well as on account of the large population increase.

Salt Lake City, Utah—The Metropolitan Water District after long study has reported that an immediate improvement program costing $2,286,750 is required for the effective safeguarding of the city's water users. Chief items called for are a $900,000 plant to filter the water of City Creek, $1,095,750 to cover and improve distribution reservoirs, and lesser amounts for the installation of continuous chlorination, and turbidity measurement apparatus on all streams of the city's watershed. The engineers found Deer Creek water more nearly pure than any other source now supplying the metropolitan area.

Dayton, Ohio—The city commission has authorized construction of a $4,700,000 water filtration and softener plant with a 96,000,000-gal. capacity.

Youngstown, Ohio—The board of control has given a contract to Alvard, Burdick & Hawson, Chicago, for a survey of the water department, and to review operating costs of the Mahoning Valley sanitary district.

Danvers, Mass.—The Massachusetts Department of Public Health has announced its approval of the taking of water from the Ipswich River as an emergency source of supply to ease the critical shortage in the Danvers and Middleton area. Dr. Viado A. Getting, health commissioner, warned, that there must be adequate chlorination.

Binghamton, N. Y.—Construction of four new 2,500,000-gal reservoirs for the water bureau probably will start at once, City Engineer Regis C. McNamara announced. The job is scheduled for completion by July.

Regina, Sask.—Taxpayers on Oct. 4 voted for a new waterworks system to cost about $4,500,000. Water is to be pumped 35 miles from Buffalo Pound Lake. The city is financing this

(Continued on page 64)

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1/10th of a mile long
with 1 filling!
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Saves thousands of time-wasting pen filling operations for the artist or draftsman — insures uniform thickness of line from hairline to ⅜" thick. Ideal for lettering, freehand drawing, technical drawing, sketching, or stenciling with the interchangeable nibs. Graphos uses any drawing ink, black or colored. Handles exactly like any drawing pen—beautifully balanced, light-touch. Time-tested — thousands in use in leading drafting rooms and art studios all over the world.
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Pelican WATERPROOF DRAWING INKS
Yes, even fine lines are obtained without breaks and without running with these superb inks backed by 112 years of quality manufacture. Absolutely waterproof; free-flowing; will not dry in ruling pen. Intense, opaque black and 19 clear, brilliant colors, blendable and dilutable. In 1 oz. bottles, handy cartridges and larger containers.

2 decades of CLEAN

22 Years of 'Round-the-Clock Operation Proves Dependability of G-E Equipment

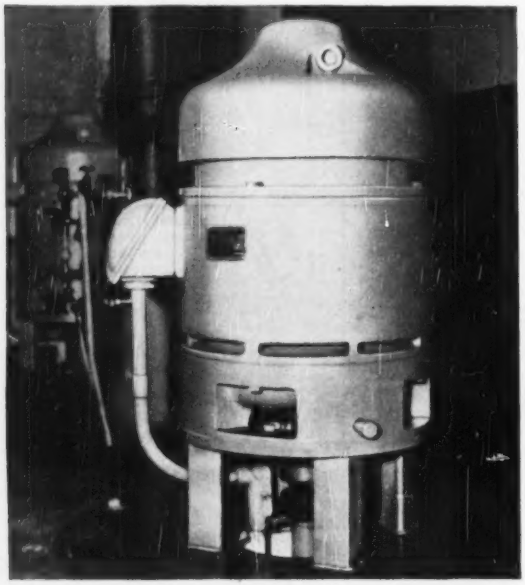
Backed by General Electric motors and control, the Greater Greenville Sewage Treatment and Disposal Plant has maintained Clean Waters for the people of Greenville, S.C. for the past 22 years.

The present installation includes some 57 G-E motors, 3 G-E generators, and a wide variety of G-E control equipment. According to the operating superintendent, General Electric equipment has never let them down during the 22 years of continuous operation—a good indication of the kind of service you can expect from G-E co-ordinated electrification.

In 1951, this far-sighted city expects to meet the new demands of its expanding population with a complete modernization and expansion of its pollution-control facilities.

General Electric can help you, your consulting or city engineer, and your contractor in (1) winning public support with the complete G-E packaged program "Modern Sewage Treatment" including the full-color sound movie Clean Waters, and (2) by assisting in the formulation of electrical plans.

Make your pollution-control program a success by contacting your G-E representative early in the planning stage. *Apparatus Dept., General Electric Co., Schenectady 5, N. Y.*



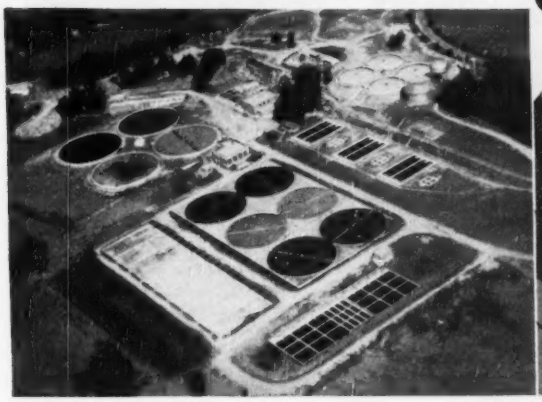
The present Greenville plant has 8 G-E motor-driven pumps. The above 20-hp vertical dripproof unit is coupled to a centrifugal pump for raw sewage. The cast-iron construction is highly resistant to corrosion.

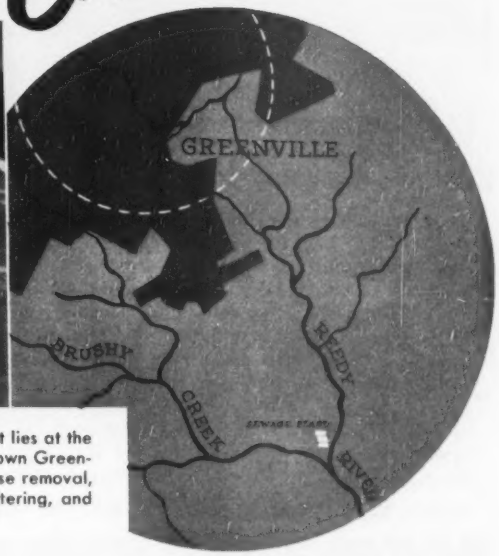
Recirculation from filters to raw sewage is accomplished with G-E motor-driven pumps. Full-voltage starters are mounted in watertight enclosures (right).

GENERAL ELECTRIC

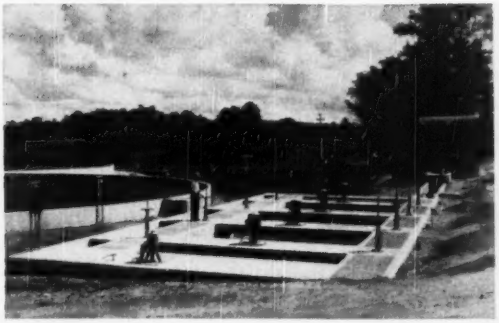
666-59

WATERS *at Greenville*

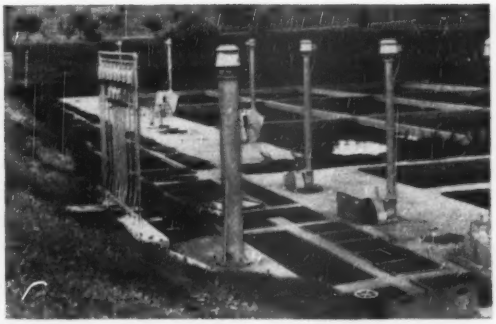




The Greater Greenville Sewage Treatment and Disposal Plant lies at the junction of Brushy Creek and Reedy River, 5 miles from downtown Greenville, S. C. Treatment includes coarse screening, grit and grease removal, pumping, aeration, primary and final clarification, trickle filtering, and sludge digestion and drying.



Mechanical aerators at Greenville are driven by the sturdy General Electric vertical motors shown here. These outdoor installations have withstood the abuse of all extremes of weather.



G-E vertical motors and G-E control for sedimentation tanks are mounted on pipes above high-water level. Like other G-E equipment at Greenville, they have given years of dependable service.

GE CO-ORDINATED **SEWAGE-PLANT** ELECTRIFICATION

dry-cleaning the Beach

● You don't send a beach out to the cleaners. But take a look at this beach being dry cleaned. With Waukesha power! The top layer of sand, to a depth of nine inches, is being scooped up and screened . . . broken glass and other dangerous debris removed and articles of value recovered . . . and the clean sand, fluffed and aerated, is being replaced—by the *Beach Sanitizer* built by Sanitized Beaches, Inc.—a division of Stephens-Adamson Mfg. Co., Aurora, Ill. Powered by its Waukesha XAHU Gasoline Power Unit—4-cyl., 3⅝-in. x 4½-in., 186 cu. in. displacement; 43 hp. max. at 2000 rpm.—the *Beach Sanitizer* cleans a 6½-ft. wide strip of beach at a speed up to 1½ m.p.h., handling 2000-3500 sq. yds. of sand an hour. For details of this and other Waukesha Industrial Power Units, 8 hp. to 400 hp., send for Bulletin 1408.

WAUKESHA MOTOR COMPANY, WAUKESHA, WIS., NEW YORK, TULSA, LOS ANGELES

WAUKESHA POWER

Model XAHU

ALUMINUM LIGHT POLES—The first of nearly 1,800 aluminum light poles to be erected in Pittsburgh, Pa., are now being installed in Schenley Park. Constructed of aluminum alloys, the poles will be used in various sections of the city, including the area now being redeveloped in downtown Pittsburgh. The poles are of a tapered octoflute design, 7½ in. dia. at the bottom and 4 in. at the top. Bracket arms, bases and fittings are also aluminum. The poles are designed to withstand wind velocities of 125 mph. and are equal in strength and stiffness to poles of other materials. The aluminum alloys used have a high degree of resistance to corrosion in industrial atmospheres and will not require painting. The poles were manufactured by Union Metal Manufacturing Co. Broadway Maintenance Corp., will install and maintain the equipment for ten years, after which it will become the property of the city of Pittsburgh.

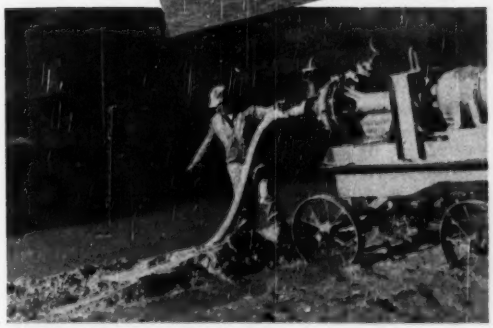
through a debenture issue, which will pay for 35 miles of pipeline, and lakeside pumping and water purification equipment. The federal government has agreed to keep an adequate water level on the lake at an estimated cost of $650,000. The provincial government is paying $650,000 towards construction of the lakeside purifier and pumphouse.

San Diego, Calif.—J. L. Burkholder, general manager and chief engineer of the San Diego County Water Authority, has recommended that the route of a proposed second barrel of the San Diego Aqueduct should parallel the present line's right-of-way from San Jacinto to San Vicente reservoir. The authority is preparing for early construction of the project to double delivery of Colorado River water to the San Diego area because of increased military demands in the area. Burkholder estimated construction cost on the route he recommended at $14,111,000, which he said is cheapest of three which have been proposed to the board. The recommendation is now before the board's engineering committee for decision. He said final costs on the first barrel, completed in November, 1947, have been estimated at $13,500,000.

THRIVING ON A DIET OF MUD AND WATER

U. S. Rubber Hose does a multitude of jobs from dredging to de-barking trees

ALL-DAY SUCKER describes hose built by U. S. Rubber to meet the severe requirements of sand suction service. Each length is custom-made to take the strong vacuum needed to draw bulky wet sand, muck, coral and rock. A tough rubber tube counteracts their terrific cutting action. Wire reinforcement prevents collapse under extreme suction and constant shifting action.



WATER SUCTION AND DISCHARGE HOSE by "U. S." can readily be rounded out, if crushed or flattened in service. It is lighter in weight than ordinary constructions, yet it is remarkably flexible and durable. When the operating conditions are unusual, "U. S." engineers design a construction to meet them.

RAZOR OF WATER! At a pressure of 1400 lbs. per sq. in., the 2 jets of water spurt from special U. S. Rubber hoses on this de-barking machine, can strip a 20-ft. log in 30 seconds. So great is the pressure on this hose that if the to-and-fro movement of the nozzles were slowed down, holes would be bored in the log.

The research and design staff of United States Rubber Company is always at your disposal when you have a question about hose. They know the latest developments in the hose field, new techniques, new methods, new economies. They can make hose do many things it has never done before, are constantly developing hose that meets new standards in efficiency, durability and safety. Write:

A PRODUCT OF

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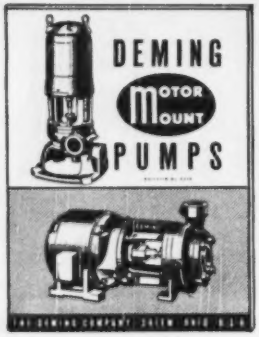
SERVING THROUGH SCIENCE

UNITED STATES RUBBER COMPANY

ROCKEFELLER CENTER, NEW YORK 20, N. Y.

NEW!
MOTOR MOUNT
PUMPS
for all Industries



GET THE FACTS!

Send for free copy of Bulletin No. 4350. It's the quickest way to get the facts on this entirely new line of Deming "MOTOR-MOUNT" Centrifugal pumps.

The line includes 25 Type "V" vertical units and 25 Type "H" horizontal units. Capacities range up to 200 gallons per minute; heads up to 165 feet. Motors from ¼ H.P. to 7½ H.P. Speeds 1750 and 3500 R.P.M.

Deming "MOTOR-MOUNT" Centrifugal Pumps will handle liquids not exceeding 200°F. Construction features, performance tables and other useful data are included in Bulletin No. 4350. Write for your copy.

THE DEMING COMPANY
536 Broadway Salem, Ohio

Deming Pumps

DEVELOPMENTS ABROAD

Engineers are needed for Snowy Mt. project

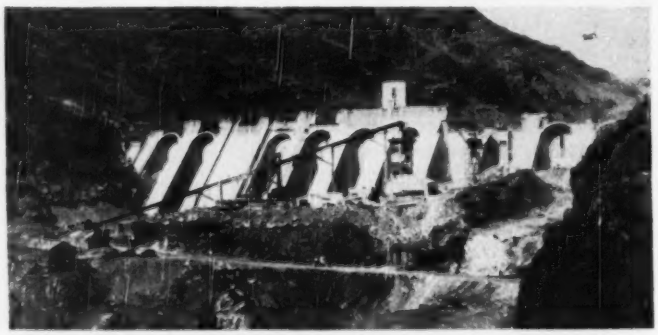
Recruiting of staff is going ahead for the Snowy Mountains hydro-electric scheme, said to be biggest development ever undertaken in Australia.

Bordering the states of New South Wales and Victoria, the Snowy River area contains Mount Kosciusko, Australia's highest peak, and three of the country's most important rivers rise in the area, including the Snowy, the Murray and the Murrumbidgee. It is the great elevation of the Snowy in relation to the other rivers, coupled with the high precipitation which makes the scheme so favorable for the development of water power.

The plan involves the construction of major dams, 87 miles of tunnel, 16 power stations and nearly 500 miles of high elevation race lines which will intercept the mountain streams and lead them to the storage reservoirs and tunnels. About 2,750,000 kw. of electricity will be produced and more than 2,000,000 ac ft. of water will become available for irrigation.

(Continued on page 69)

ALL ROADS LEAD TO ROME.—This is a view of the front of the new railway station in Rome, Italy. Reconstruction of the old station began in 1938 but World War II interrupted the work. Recently the task was completed and the station has been entirely rebuilt. The height of the main front of the station is 84 ft and the length 660 ft; the projecting roof which shelters the ticket sales offices averages about 36 ft high. A total of 440 trains use the station daily and some 120,000 passengers are accommodated each day. One hundred and twenty of the trains serve the military or are for the convenience of Holy Year pilgrims visiting the Italian capital. There are 27 tracks at the station.—Wide World Photo.



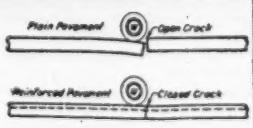
LOCH SLOY DAM.—This dam, the main part of the Scottish Electric Board's hydro-electric scheme, is well up to schedule and it is expected that it will be completed by the end of this year. One turbine, out of an ultimate four, is already operating. Sloy and Pitlochery dams will serve the major demands of Lowland industry, and their profits will help to offset losses in less economical but necessary local uses of power. The scheme started in 1945, and in spite of great difficulties, has kept up with the program of the five major contractors involved.—Keystone photo.

On the Pennsylvania Turnpike

American Welded Wire Fabric

Longer paving slabs, fewer joints, improve riding qualities on concrete highways reinforced with American Welded Wire Fabric. Reduced rate of cracking, prevention of heaving and spalling, also reduce maintenance costs, increase service life of the highway.

As the wheel load approaches an open crack in plain pavement, one slab end carries the entire load. As the wheel load approaches the closed crack in pavement reinforced with American Welded Wire Fabric, both slab ends, instead of one, carry the load, preventing damage to the slab and to the subgrade.



THE men who plan and build our modern concrete superhighways have helped to make American Welded Wire Fabric the world's most widely used reinforcement for pavement construction.

American Welded Wire Fabric keeps cracks that may form tightly closed—preventing progressive damage — distributes stresses, strains and impact in all directions.

U·S·S American Welded Wire Fabric reinforcement in rolls or in flat sheets is easily handled, lies flat and stays in place. This means important savings in labor costs and construction time.

Standard styles of U·S·S American Welded Wire Fabric are available in every locality from jobbers' stocks when furnished in rolls. When flat sheets or special styles of fabric are required—you can depend upon our Donora, Pa. and Joliet, Ill., mills to maintain your construction schedules.

When you are planning any type of concrete construction, our technical staff will supply complete data on specific designs and standard styles of fabric that are most readily available. Literature containing valuable information is also available. Write to our nearest sales office today, you incur no obligation.

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reinforcement

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NEW FEATURES

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YES, the White Engineers' Transit is a fine engineer's instrument — now made even finer with the addition of *covered leveling screws* and *coated optics*.

Covered leveling screws assure you of smooth, easy, precise leveling at all times, under all kinds of conditions for the life of the instrument itself.

Coated optics guarantee clear, sharp, accurate images — without halation, at longer distances, even under adverse conditions.

Compare the David White Engineers' Transit with all others—feature for feature — price for price. Compare them for accuracy — long durability — built-in quality. To meet your preference, this instrument is available with "U" or "A" type standards. You'll find you'll buy right when you buy a David White.

Contact our nearest dealer for complete details of the David White Engineers' Transit and for other fine Engineering Instruments—or write direct to David White, 315 W. Court St., Milwaukee, Wis.

DAVID WHITE COMPANY

We offer complete, prompt repair service on all makes of instruments — levels, transits, theodolites, etc.

The project will need several hundred engineers and a labor force of about 16,000 in a peak construction year. Applications from the United States and Canada should be sent to the Snowy Mountains Hydro-Electricity Authority, Box 4,900 G.P.O., Sydney.

Build 700 concrete homes for Borneo oil workers

The construction of a self-contained oil township of more than 700 houses in Brunei, British Borneo, is being undertaken near the Seria oilfields. The houses are being built by the "Situfoam" method, developed by George Wimpey and Co., London. Sand, cement and water are mixed with a suitable foaming agent. The resulting concrete, it is claimed, is light in weight and possesses a heat insulation value better than brickwork.

The walls of the buildings are cast on the site. After preparation of foundations, a light prefabricated formwork is erected to the complete size and shape of the building up to eaves level. Special cores are inserted to form door and window openings. Fluid "Situfoam" is then pumped by air pressure through a flexible hose from the mixer and is poured into the framework.

Rebuilding Normandy—The Economic Cooperation Administration reports that the equivalent of $19,000,000 in counterpart francs—foreign currency deposited by France to match ECA dollar grants—has been allocated for a vast housing program for Normandy families who have been living in cellars, pillboxes and barracks for the last six years. More than 40,000 workers, ECA said, are rebuilding this area's cities and villages, some of which were completely leveled during the invasion. The village of Aunay-sur-Oden, near Caen, for example, was rebuilt from scratch, and today boasts new shops, new streets, a new hospital, and a new city hall—all constructed from white stone quarried in Normandy.

To build a city—President Miguel Aleman of Mexico has approved plans for the construction of a new city, with all modern facilities, to accommodate a 15,000 population, at Ciudad Guerrero, Tamaulipas State, near the Falcon Dam on the Rio Grande.

NEW PHOTOGRAPHIC MATERIALS...
NEW DRAFTING SHORT CUTS

Eliminate Costly Retracing

at INGERSOLL-RAND
Phillipsburg, N. J.

"Ink quality" file copies of pencil drawings are produced with Kodagraph Autopositive Cloth

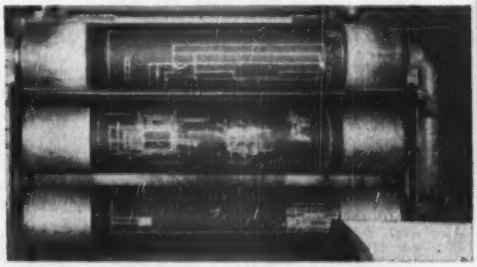
Instead of making expensive "ink on cloth" tracings of its original drawings, Ingersoll-Rand simply reproduces them on Kodagraph Autopositive Cloth. This new photographic material produces positive copies *directly* (like Kodagraph Autopositive Paper and Film) . . . without the negative step . . . without darkroom handling. No special equipment is required, either: a photocopy machine is used for the exposure operation . . . standard photographic solutions for development. *Result:* intermediates that have the sharpness, the sparkle of new ink tracings . . . with non-smudging, dense photographic black lines on a durable white cloth base.

Old, soiled, or damaged drawings are restored with Kodagraph Autopositive Paper

When such drawings are taken from the files, the call is for Kodagraph Autopositive Paper—to eliminate hours of expensive retracing time. This low-cost, high-contrast photographic material increases line density . . . cleans up backgrounds . . . in many cases delivers serviceable intermediates that require no handwork at all. Drawings in very poor condition are restored by Ingersoll-Rand in the following manner: after an "Autopositive" is made, stains, creases, and other unwanted elements are removed with eradicator fluid or razor blade. Then, the print is used to produce a second "Autopositive," which is touched up with pencil if necessary.

Standard units are added to new drawings with Kodagraph Autopositive Film

Among the many ingenious drafting short cuts developed by Ingersoll-Rand is the use of Kodagraph Autopositive Film overlays made from standard-component drawings. These transparencies are kept on file . . . and taped to new drawings whenever necessary. Following this, the composite is reproduced on Autopositive Paper. *Result:* a photographic intermediate of uniform line density . . . plus important savings in drafting time.



Additional advantages of using Kodagraph Autopositive intermediates

Sharper, cleaner blueprints are produced—at uniform, practical speeds—because Ingersoll-Rand makes them from "Autopositives" instead of its perishable original drawings. This way—there's far less chance of "reading errors" in the shop. And valuable originals are protected against machine wear and tear . . . constant handling; are kept safe in the files available for reference and revisions only.

Kodagraph Autopositive Materials

"The Big New Plus" in engineering drawing reproduction

MAIL COUPON FOR FREE BOOKLET

Learn in detail how you can use Kodagraph Autopositive Paper, Cloth, and Film — the revolutionary products which you, or your local blueprinter, can process quickly, economically. *Write today* for a free copy of "Modern Document and Drawing Reproduction."

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Industrial Photographic Division
Rochester 4, N. Y.

Gentlemen: Please send me a copy of your illustrated booklet giving all the facts on Kodagraph Autopositive Materials.

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(please print)
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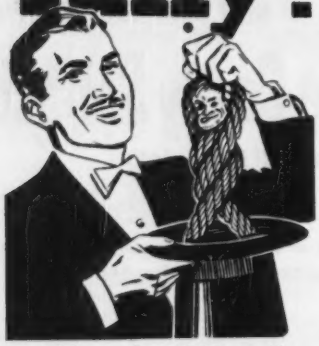
TRADE-MARK

Tuffy!



Magic Word in Rope Buying

You don't have to be a magician—or even a mathematician—to order, stock or install any member of the Tuffy family of special purpose wire ropes. Just say or write "TUFFY!" to your Union Wire Rope distributor—plus the size, length and type required. Tuffy special purpose wire ropes will give longer service, handle more yardage or tonnage at a lower ultimate cost.

Tuffy SCRAPER ROPE..

Test Tuffy's ability to handle extra yardage on the toughest scraper jobs. You'll change to Tuffy on your whole fleet!

Tuffy DRAGLINES...

Put Tuffy Draglines to any test. Watch them come out on top with unequalled money-saving records. To order just specify length, diameter and "Tuffy"!

Tuffy SLINGS.....

An entirely different, patented, interlaced wire fabric construction gives Tuffy Slings extraordinary stamina and flexibility. Factory Fitted.

Tuffy CHOKER....

Wire rope specially stranded and socketed for extra strength, stamina, flexibility required in logging.

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CITY _____ *ZONE* _____ *STATE* _____

MEN AND JOBS

Maj. Gen. H. A. Young, civil engineer vice-president of Central Mortgage and Housing Corp., has been appointed Deputy Minister of the Canadian Department of Resources and Development.

J. S. Harrison, former city engineer and city manager at Morton, Tex., has become city engineer of Bryan, Tex. He succeeds J. M. Orman who has been made Public Works Director at Midland, Tex.

Charles Nagel, who for the last five years was associated with Lawrence Peterson & Associates, consulting civil engineers of Milwaukee, Wis., has formed Charles Nagel and Associates with offices at 711 W. Wells St., Milwaukee.

James Robert Whitley has been appointed division rural road engineer for the Tennessee State Highway Department, Nashville. An employe of the department in various capacities since May, 1924, he attended the College of Engineering of the University of Tennessee, Knoxville.

James Ovington, member of the city engineer's office in Pomona, Calif., since 1922, has been named city engineer, Norman J. Stiene, resigned.

Rodney C. Richardson has succeeded **W. H. Hamblin** as assistant to C. H. Purcell, California Director of Public Works. Hamblin has been called back into service with the Navy. Richardson formerly served as deputy director, Governor's Office of Planning and Research, assistant chief, Airport Master Planning Staff and executive secretary of the Calif. Veterans Commission.

Edgar M. Hastings, the chief engineer of the Richmond, Fredericksburg and Potomac R. R. since 1922, retired on Nov. 1. He was succeeded by **J. C. DeJarnette, Jr.,** former division engineer of the railroad. Mr. Hastings, a past president of the American Society of Civil Engineers and the American Railroad Engineering Association, had been with the R. F. & P. since 1903. Mr. DeJarnette began work with the R. F. & P. as a rodman after two years at Randolph-Macon College. In 1925 he was named resident engineer on the track elevation work through Fredericksburg, Va., including bridges over the Rappahannock River and Powell Creek. In 1929 he was advanced to assistant engineer, construction and maintenance, and in 1941 was appointed supervisor of track at Fredericksburg. Two years later he was named division engineer.

I. C. Du Val, for 25 years in the public works department of Richmond, Va., has been appointed head of the bureau of engineering.

(Continued on page 72)

Brig. Gen. Pierre Douchy, right, commandant of the Engineer School at Angers, France, is shown being greeted by Col. H. J. Skidmore, director of the Corps of Engineers, Waterways Experiment Station, Vicksburg, Miss., upon the former's arrival at the local airport. Lt. Col. George C. Branner, left, accompanied General Douchy. Sponsored by the Mutual Defense Assistance Program, General Douchy arrived by special plane for a two-day visit to observe the roll of the Waterways Experiment Station in the education and training program of the Corps of Engineers officers; its relation to national defense; and the position it occupies in the civil construction program of the Corps of Engineers.

Construction view, State Office Building, Jackson, Miss. Architects: E. L. Malvaney & Assoc. Structural engineer: Harry Howe. Contractor: J. A. Jones Construction Company.

Quality Construction at substantial savings with CONCRETE FRAMES AND FLOORS

REINFORCED concrete frame and floor construction offers both high quality and economy. A typical example is the State Office Building in Jackson, Miss. illustrated above, where it was considered the most economical high-grade construction for a building of this type and size.

Cost analyses and competitive bids throughout the nation show that savings up to 40% are made with reinforced concrete frames and floors.

Substantial savings in time result too. Frame and floor construction proceed simultaneously. Thus masons, plumbers, electricians and other tradesmen can do their jobs while the structural work progresses. Such construction meets all the requirements for flexibility in conduit layout.

Slab band floor construction, which was used in the State Office Building in Jackson, also permits a reduction in total building height. This saving is due to the elimination of the headroom required by conventional beams and girders in other types of construction.

Architects and structural engineers like the wide latitude and flexibility they have in locating partitions with slab band floors. The result is efficient use of total floor area.

Should you desire help in attaining quality concrete or the maximum structural advantages of reinforced concrete construction on any project our technical staff will be glad to assist you.

If you want more information about reinforced concrete frame and floor construction write for two free booklets: *"Continuity in Concrete Building Frames,"* and *"Handbook of Frame Constants,"* distributed only in the U. S. and Canada.

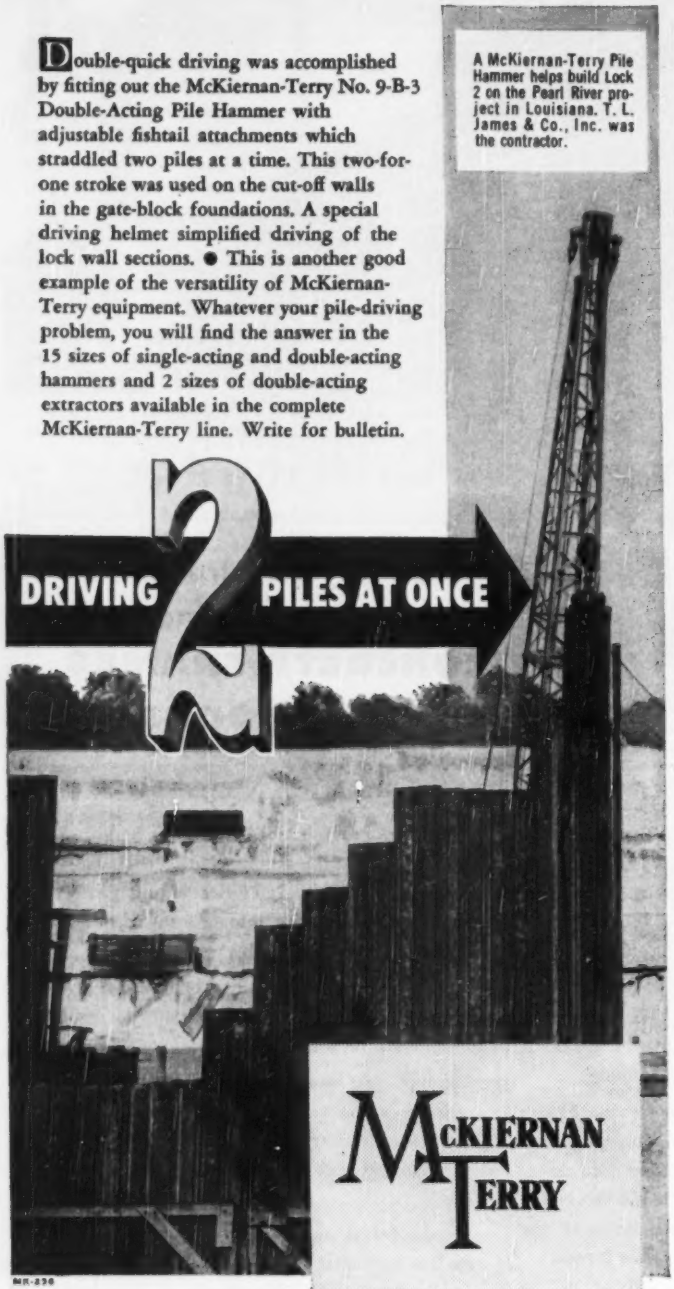
PORTLAND CEMENT ASSOCIATION

DEPT. 12a-17, 33 WEST GRAND AVENUE, CHICAGO 10, ILLINOIS

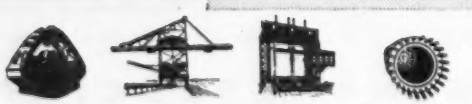
A national organization to improve and extend the uses of portland cement and concrete through scientific research and engineering field work

Double-quick driving was accomplished by fitting out the McKiernan-Terry No. 9-B-3 Double-Acting Pile Hammer with adjustable fishtail attachments which straddled two piles at a time. This two-for-one stroke was used on the cut-off walls in the gate-block foundations. A special driving helmet simplified driving of the lock wall sections. ● This is another good example of the versatility of McKiernan-Terry equipment. Whatever your pile-driving problem, you will find the answer in the 15 sizes of single-acting and double-acting hammers and 2 sizes of double-acting extractors available in the complete McKiernan-Terry line. Write for bulletin.

A McKiernan-Terry Pile Hammer helps build Lock 2 on the Pearl River project in Louisiana. T. L. James & Co., Inc. was the contractor.



MR-236



GRAB BUCKETS COAL TOWERS TRANSFER BRIDGES HONING TO 42"I. D.

McKIERNAN-TERRY CORPORATION, MANUFACTURING ENGINEERS • 13 PARK ROW, NEW YORK 7, N. Y.
PLANTS: HARRISON, N.J. and DOVER, N.J.

The South Carolina Water Pollution Control Authority has named **W. T. Linton** as executive director and George A. Rhame as engineer-chemist.

Harold E. Nelson has become executive officer of the Pittsburgh District, Corps of Engineers. He will serve as assistant to the district engineer in work involving flood control and navigation projects and in the construction of two VA hospital projects in Pittsburgh.

Col. David M. Dunne, district engineer in charge of the Arnold Air Engineering Development Center construction, has reported to Camp Rucker, Ala., for "troop duty". He will assist in reactivating the camp. Lieut. Col. Hugh M. Arnold, succeeds Colonel Dunne.

R. B. Dulaney, staff assistant with the Atlantic Coast Line Railroad at Wilmington, N. C., has been appointed assistant to the general superintendent of motive power and equipment. A graduate of the North Carolina State College Engineering School, he joined the Atlantic Coast Line in 1947 and has served as draftsman and assistant superintendent at Waycross, Ga., and Rocky Mount, N. C.

John Newberg has been named engineer for the Otsego County Road Commission, Gaylord, Mich. Mr. Newberg was graduated from the University of Michigan as a civil engineer. He served 32 months as a navigator in the U. S. Air Corps.

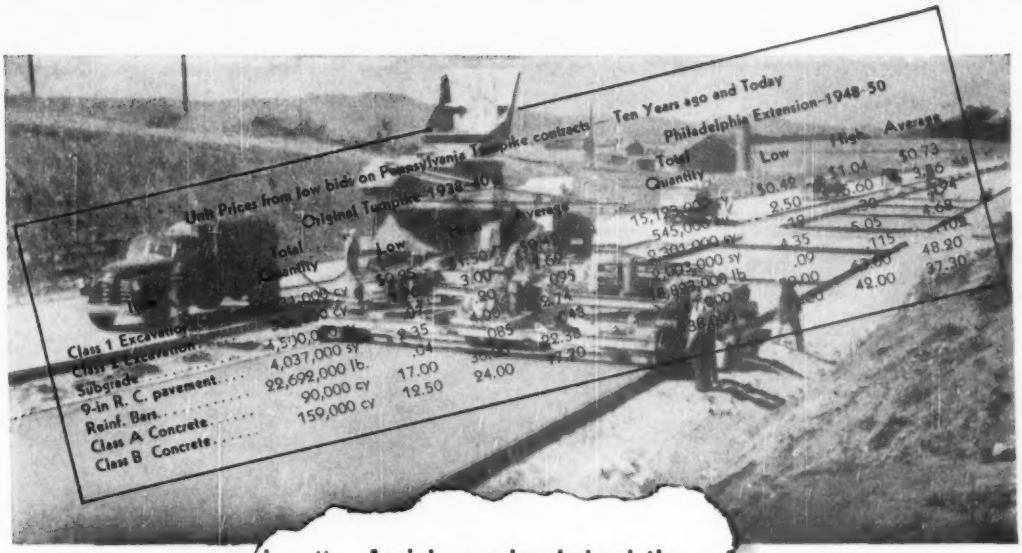
Jeffrey R. Stewart, formerly an ordnance engineer at Raritan Arsenal, Metuchen, N. J., has recently been appointed by the Department of the Navy as Paint and Plastics Technologist in their Bureau of Yards and Docks, Washington 25, D. C.

Capt. Herman D. Johnson, a civil engineer, has been named city manager of Milford, Del.

Firman Brown, Flathead Indian irrigation project engineer at St. Ignatious, Mont., has been appointed area irrigation engineer for the Indian Service at Billings. He succeeds **Wilbur S. Hanna**, retired.

J. D. Thomas is project manager of Loving-Weaver Construction Co. on the construction of a $10,000,000 housing project at Fort Bragg, N. C., which includes 600 apartment units, 400 individual houses, and a shopping center.

Lt. Col. Hugh M. Arnold has been
(Continued on page 77)



E. N. R. PHOTO

"...Aerial mapping helped the location. The map took five months to produce, about one-fifth the time needed for a ground-surveyed map; it cost about one-fifth, too."*

**All data and charts from Engineering News-Record for June 15, 1950—"Penn Turnpike Stretches East."*

TODAY turnpike construction costs are up 87 percent over ten years ago, says *Engineering News-Record*. Every cost is up . . . except one! Turnpike aerial mapping costs about one-fifth as much as ground surveys—can be done in one-fifth the time.*

That's AERO SERVICE MAPPING. AERO SERVICE SPEED AND ECONOMY! And that's why AERO maps for large oil and mining interests in Alaska and Canada—in Venezuela and the Caribbean—in Portuguese East Africa and Tunisia—in the Union of South Africa and the Middle East.

And at home—AERO maps for large steel companies . . . timber interests . . . railroads . . . power companies . . . strip mines . . . city planners . . . highway departments of many states.

Mapping for industry is our business. Let our engineers help your staff advance exploration or development schedules by many months.

AERO SERVICE *mapping is the only construction cost that is down.* Write AERO SERVICE today.

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TOPOGRAPHIC MAPS • PLANIMETRIC MAPS • PRECISE AERIAL MOSAICS • AIRBORNE MAGNETOMETER SURVEYS • RELIEF MODELS • COLOR PHOTOGRAPHY

BIG YARDAGE

AT LITTLE COST

Ask Your GAR WOOD—ALLIS-CHALMERS DEALER FOR A DEMONSTRATION

Gar Wood 625 SCRAPER

Matched with the NEW Allis-Chalmers HD-20 Tractor

Because it loads more dirt quicker . . . takes a full heaping load every time . . . dumps faster and spreads under accurate control, the entirely new Gar Wood 625 Scraper puts the bite on yardage costs. A typical contractor comment is: "Fastest loading and dumping scraper for its size on the market."

The new 625 with its bowed cutting edge loads easily with less tractive effort due to the live boiling action. Positive forced ejection wipes the bowl clean every trip.

Used on the most gruelling jobs, the 625 has proved its ability to handle sand, muck, wet clay and other soils in all kinds of weather. Construction is extra heavy in all details. Design is completely modern and includes every feature for lower earthmoving costs. Get full information on the new 625 . . . use the coupon below.

COST-CUTTING FEATURES

- 24.5 cu yd heaped capacity
- 19.2 cu yd struck capacity
- Open bowl
- Live boiling action
- Extra large apron opening
- Forced ejection under power
- High clearance and low center of gravity
- Closely controlled ejection for accurate spreading
- Large tires for greater flotation
- Extra strength throughout . . . plenty of "beef" where needed

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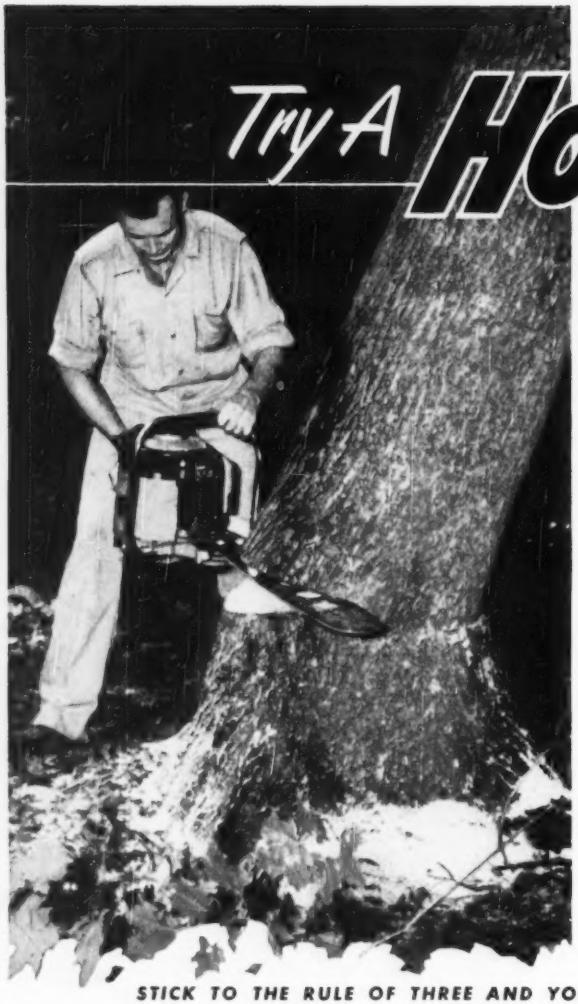

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THE *One Man* SAW THAT DOES THE WORK OF OTHER TWO MAN SAWS

You have to see it to believe it. You have to use it to know it. But once you try a Homelite . . . the newest and most startling one man gasoline-engine-driven chain saw . . . you're sold on it *one hundred per cent.* Whether you're using it for cutting, bucking or clearing trees or for cutting timber or piling, its complete ease of handling and fast cutting thoroughly convince you that here is a one man saw that truly does the work of other two man saws . . . a saw that will cut your cutting costs right down to the solid ground. Just ask for a free demonstration. We'll gladly give it anywhere.

STICK TO THE RULE OF THREE AND YOU'LL ALWAYS STICK TO A HOMELITE

1. PERFORMANCE The high, steady power of the famous Homelite engine, driving the special chrome plated perma-sharp chain, gives you unsurpassed cutting performance.

2. DEPENDABILITY A Homelite Chain Saw's dependability has been established by Homelite's quarter century of building more than 285,000 gasoline engine driven units.

3. SERVICE Forty-eight factory service branches located throughout the country are completely equipped and instantly ready to keep your Homelite Gasoline Engine Driven Chain Saws *always* on the go.

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CORPORATION

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appointed Tullahoma, Tenn., district engineer, succeeding **Col. D. M. Dunne,** who has been recalled for "troop duty". Colonel Arnold was assistant district engineer and district operations officer. In World War II he saw action in the West Indies and in the Central Pacific.

Joseph L. Johnson, a construction engineer and a West Point graduate, leads a new industrial construction division of the C. B. Snyder Realty Organization, Hoboken, N. J.

Merger of the firms of **Edwards and Kelcey,** and Lawrence T. Beck and Associates, consulting engineers, into a new partnership of Dean G. Edwards, Guy Kelcey and Lawrence T. Beck, has been announced. The new firm, to be known as Edwards, Kelcey and Beck, will specialize in expressway, traffic, terminal, transportation, sanitation and water supply problems. Offices will be at 250 Park Avenue, New York City and 3 William Street, Newark, N. J.

Engineering graduates recently added to the staffs of the Oak Ridge National Laboratory, Oak Ridge, Tenn. are: **Harold E. Butcher,** civil engineer from the University of Tennessee, 1948 and **Charles M. Carter** civil engineer from the University of Tennessee, 1950.

George Poore, principal assistant Montana state highway engineer, has resigned at the request of Troy Carmichael, state highway engineer. He will be replaced by Henry C. Helland, former bridge engineer for the department now employed by Canyon Constructors, the firm building the Reclamation Bureau's Canyon Ferry Dam near Helena. Poore had been with the department 29 years. Carmichael said the action did not reflect on Poore's ability or his devotion to the good of state highways.

Young J. Wright, engineer, has been named to succeed Ellwood Johnson as superintendent of the Washington, D. C., Sewer Division. Wright has been assistant superintendent.

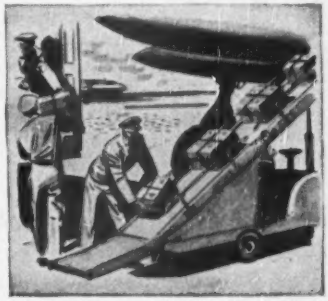
C. R. Lapeza, office engineer at Wilmington, N. C., for the Atlantic Coast Line R. R., has been named assistant to the general manager. A graduate of the University of New Hampshire, he joined the Atlantic Coast Line in 1944. **W. E. Free** who has been serving as roadmaster at Albany, Ga., has been named office engineer in the office of the chief engineer at Wilmington. He is a graduate of Alabama Polytechnic Institute.

(Continued on page 81)

Completes 300 TV sets— meets daily quota (at a cost of $4.70)

Delicate coils were needed by Midwest manufacturer to complete 300 TV sets . . . and Massachusetts supplier was 920 miles distant! Air Express assured delivery by 8 o'clock next morning, so manufacturer ordered 500 men to report for work. Shipment arrived 7:20 A.M.—production rolled! Shipping cost for 17-lb. carton only $4.70! Manufacturer uses Air Express regularly to keep business in high gear.

$4.70—and special pick-up and delivery included! Low Air Express rates cover door-to-door service. More convenient—easy to use. Just phone for pick-up! (Many low commodity rates in effect. Investigate.)



Air Express goes on all flights of Scheduled Airlines. Shipments keep moving around the clock—speeds up to 5 miles a minute. *Experienced* handling. Phone Air Express Division, Railway Express Agency, for *fast action.*

Air Express gives you all these advantages:

World's fastest transportation method.
Special door-to-door service at no extra cost.
One-carrier responsibility all the way.
1150 cities served direct by air; air-rail to 22,000 off-airline points.
Experienced Air Express has handled over 25 million shipments.

Rates include pick-up and delivery door to door in all principal towns and cities

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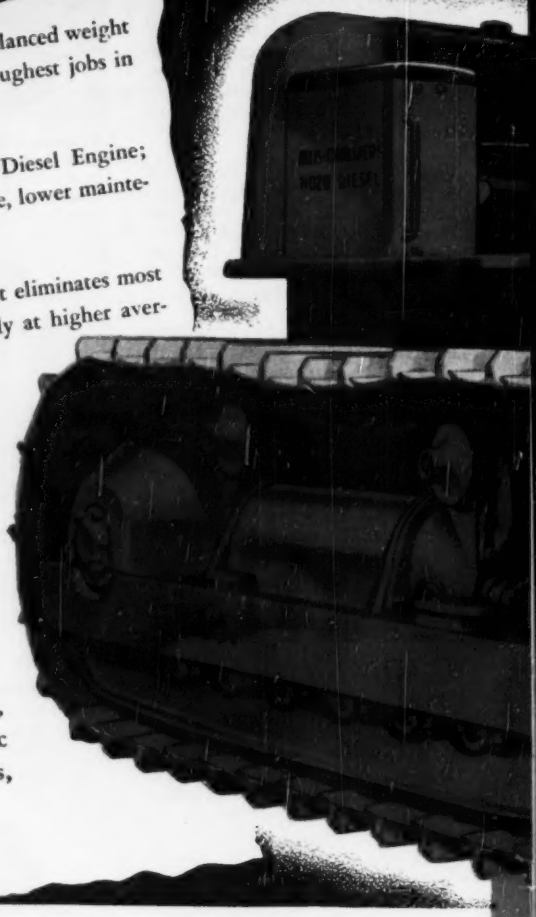
Here is the New Yardstick for

Allis-Chalmers Model HD-20

Hydraulic Torque Converter Tractor...



- **BIG AND RUGGED** . . . 41,800 lb. of properly balanced weight . . . long, wide, sure-gripping tracks. Handles the toughest jobs in stride!

- **POWERFUL** . . . Newest, latest GM 2-Cycle Diesel Engine; Model 6-110. Plenty of POWER . . . for longer life, lower maintenance, increased production.

- **HYDRAULIC TORQUE CONVERTER DRIVE** that eliminates most gear shifting and keeps tractor working smoothly at higher average speeds.

- **SIMPLE UNIT ASSEMBLY** . . . major assemblies removed and repaired or replaced without removing adjacent parts.

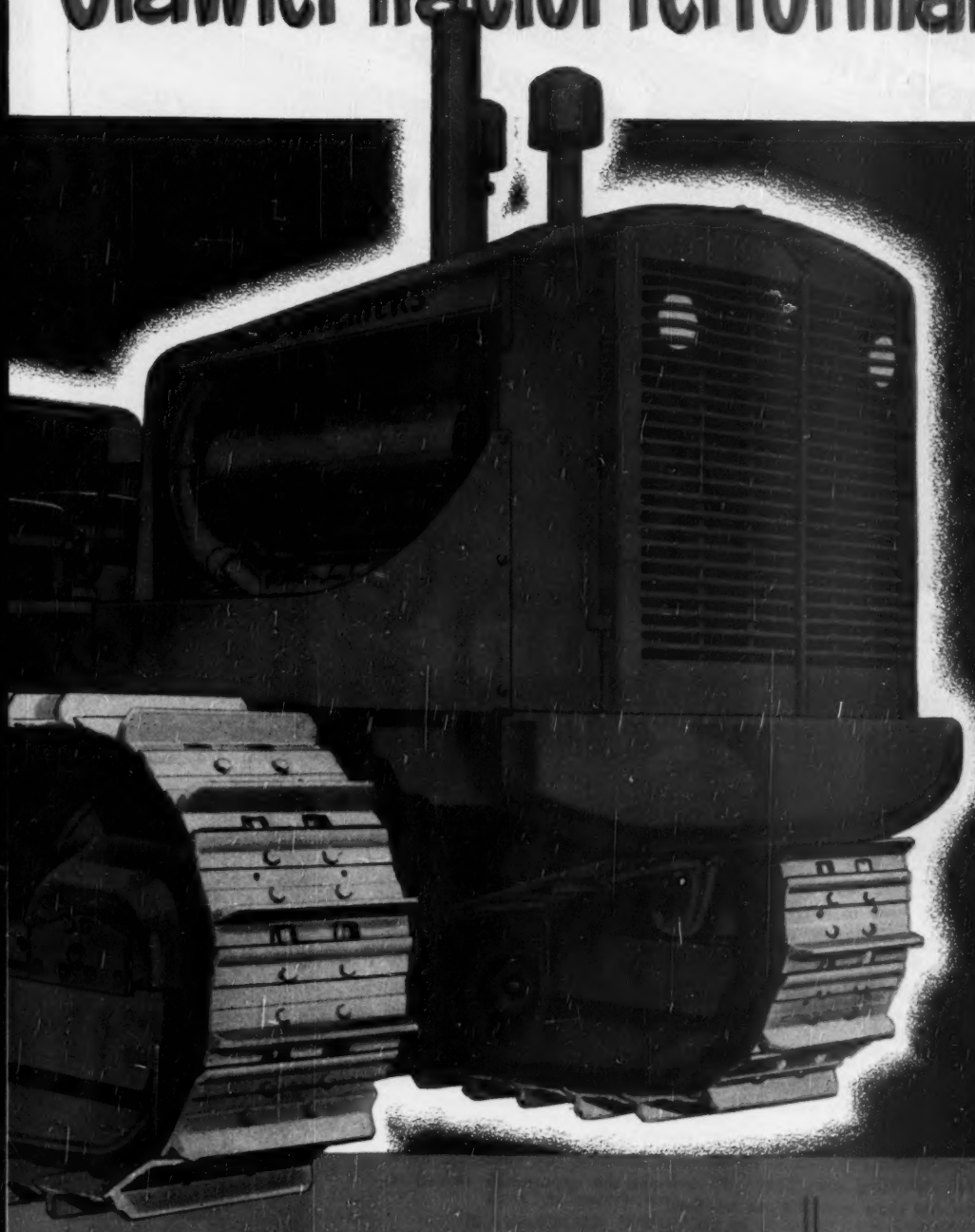
- **EXTENDED LUBRICATION PERIODS THROUGHOUT** . . . plus 1,000-hour periods on truck wheels, track idlers and support rollers with A-C's POSITIVE SEAL.

- **EVERY OPERATOR COMFORT** . . . seat, platform, controls, visibility . . . hydraulic finger-tip steering, self-energizing brakes, practically no gear shifting.

World's Finest Tractor

Get the full story from your Allis-Chalmers dealer. Arrange for a demonstration on your job at the earliest opportunity.

Crawler Tractor Performance



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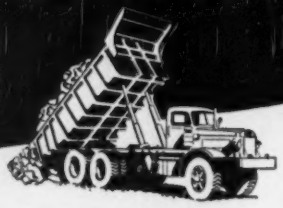
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

for Greater Production
for Easier Operation
for Simplified Servicing

Originator of the Torque Converter Tractor

Firestone TIRES



TIRES used in rock work, strip mining, and earth moving have to face a terrific amount of torture. Whether they make or lose money depends on how *well* and how *long* they can take that torture.

Firestone tires can TAKE it. Time and again they break old performance records, set new records for long service. Such performance is no accident. The extra tough, job-designed treads and the all-rayon Gum-Dipped cord bodies — protected by four extra impact plies and extra-thick sidewalls — explain why Firestone tires turn in *better* work and turn out *more* work.

Not far from your project there's a Firestone Dealer or Store organization prepared to handle your complete tire needs and lower your operating cost. They will welcome the opportunity to call on you and show how this can be done.

WHEN YOU BUY NEW EQUIPMENT OR REPLACEMENT TIRES SPECIFY FIRESTONE OFF-THE-HIGHWAY TIRES

Listen to the Voice of Firestone on radio or television every Monday evening over NBC

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Inspecting the approved aluminum panel to be used on Alcoa's new 31-story skyscraper in downtown Pittsburgh next year are, left to right, James A. Mitchell, Dahlen K. Ritchey and Philips B. Bown representing the local architectural firms of Mitchell & Ritchey, Inc. and Altenhof & Bown, Inc., who have been retained to assist the New York architectural firm of Harrison & Abramovitz, Inc. While sample section was fabricated from ¼ in. aluminum sheet, production panels used in the building will be mechanically stamped and will contain reversible type aluminum windows using heat-retardant glass to reduce air-conditioning load.

Lt. Col. James W. Sloat, Corps of Engineers, is the new executive officer of the Portland, Ore., district.

At the New England Industrial Waste Conference, Left to right, Stuart Coburn, chemist for Metcalf & Eddy, Clair N. Sawyer, MIT's professor of sanitary chemistry, and Harry N. Faber, research chemist for The Chlorine Institute, got together at the Abbot Worsted Co., Forge Village, Mass., to discuss its grease recovery plant.

PORTABLE Seismograph Equipment for CONSTRUCTION and ENGINEERING

Obtain Complete Bedrock and Foundation Information Quickly, Economically and Easily

Here is the best in portable equipment for the best method in obtaining near-surface information before starting foundation and other excavation work on any type of construction job. Seismograph surveys are much more economical than core-drilling, more universally practical than electrical resistivity surveys.

No drilling for shot holes is necessary. Equipment is easily set up either in the heart of a large city or in remote locations reached only by foot travel. Midwestern experts are available to purchasers to train your men in the use of the equipment and the interpretation of information obtained. Equipment is for sale or lease. Write for Bulletin.

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Electroforged into one piece for STRENGTH and SAFETY

Self-cleaning • Easily Maintained • Maximum open area • Simple to cut and bend for fitting around obstacles • Adaptable to many uses.

Blaw-Knox Electroforged Stair Treads available with rolled diamond checker plate nosing, twisted crossbar nosing or abrasive nosing.

***NON-SLIP*—the twist does the trick.** Maximum safety and strength . . . that's the ideal combination in Blaw-Knox *electroforged* Steel Grating. Each individual joint is electrically forged together in a union stronger than the surrounding metal! The twisted bar construction gives a firm grip on shoe soles, makes slipping impossible.

WRITE FOR BULLETIN 2296

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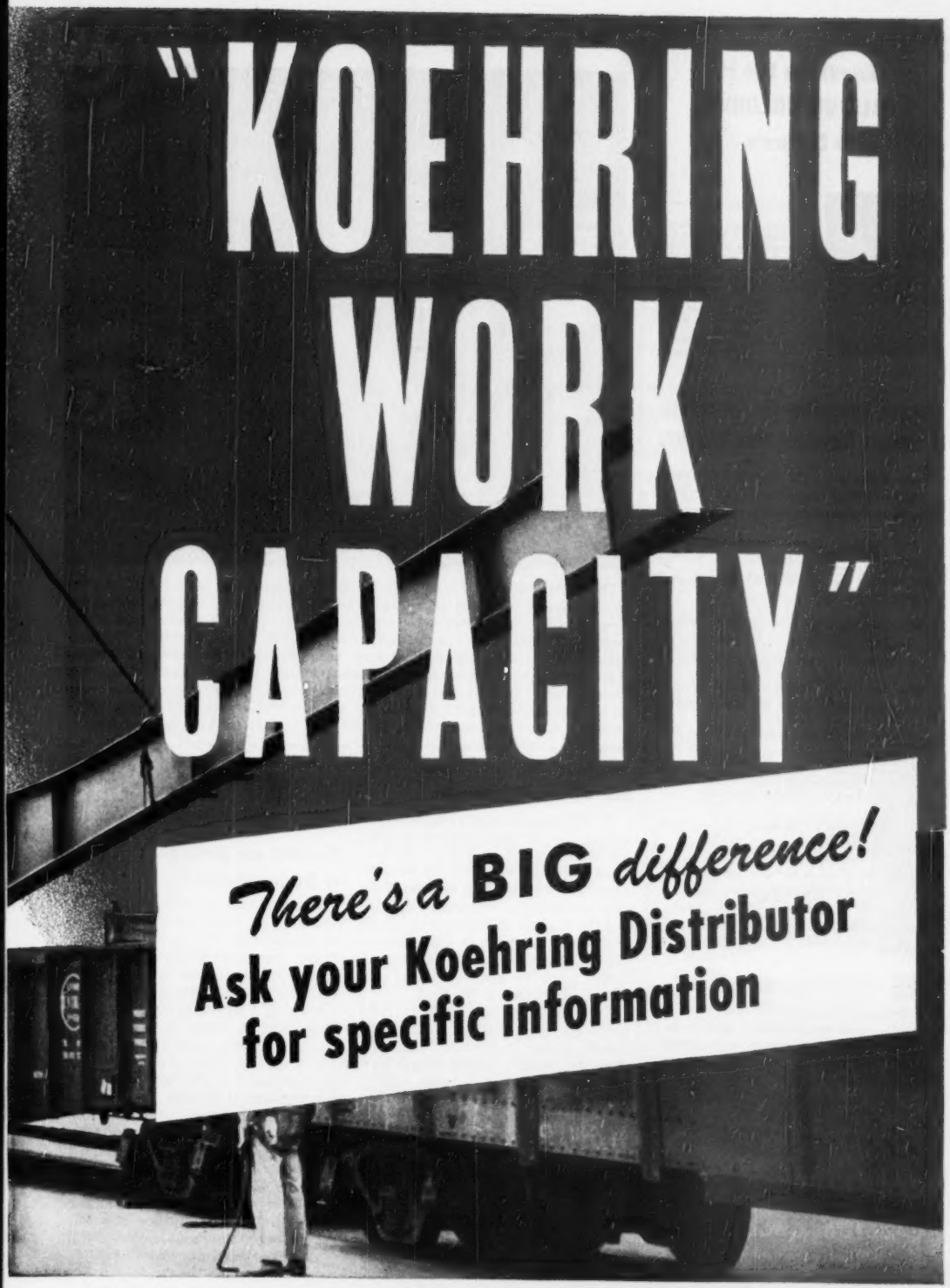
BLAW-KNOX ELECTROFORGED STEEL GRATING

KOEHRING COMPANY
Milwaukee 16, Wis. K46

Subsidiaries: KWIK-MIX • JOHNSON • PARSONS


"KOEHRING
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"The Effects of Calcium Chloride on Portland Cement" is a 40-page semi-technical book that tells you the facts about the use of Calcium Chloride in concrete. It describes in detail the carefully controlled tests that have been conducted by recognized authorities in the field and in the laboratory . . . and the results obtained.

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Everybody who works with concrete—directly or indirectly—will be interested in this book. It gives factual answers to such questions as . . .

- What happens when Calcium Chloride is added to air entrained cement? . . . to high early cement? . . . to low heat cement? . . . to colored cement?
- What are the effects of Calcium Chloride on slump? . . . on flow? . . . on workability? . . . on density? . . . on water-cement ratio?
- What are the effects on setting time? . . . on early strength? . . . on ultimate strength?
- What are the effects on volume change and on surface wear?
- How much will Calcium Chloride reduce the curing period?
- What will Calcium Chloride do for cool and cold weather concrete?

These are just a few of the questions answered in "The Effects of Calcium Chloride on Portland Cement." In addition, there are graphs, tables, charts and much material that is now available for the first time in this book.

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"The Effects of Calcium Chloride on Portland Cement" is being made available without any cost or obligation by the Solvay organization. For your free copy, simply write on your business letterhead to Dept. EN-12, Solvay Sales Division, Allied Chemical & Dye Corporation, 40 Rector Street, New York 6, N. Y. Editions are limited, so rush your request now.

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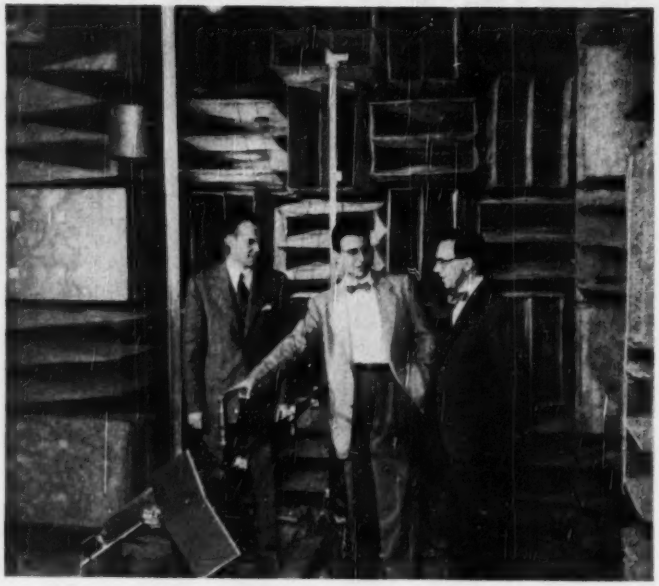


FOR QUIETER HOMES AND OFFICES—The interior of the new test chamber in the acoustics laboratory at the Massachusetts Institute of Technology, where this new scientific tool is being used to study methods to achieve quieter, more restful homes and offices. The test chamber is equipped with a panel containing 256 loudspeakers, which can make as much noise as a battalion of field artillery. Left to right, Richard H. Bolt, director of the laboratory, and Jordan J. Baruch, designer of the electronic equipment, who is pointing to an extremely sensitive micropohne which travels back and forth until it covers the entire area of a sound test section. This analysis is carried out automatically. On the right is L. L. Beranek, technical director.

Engineering institutes set up at Wisconsin

A series of 18 engineering institutes to provide technical training in engineering fields will be held at the University of Wisconsin from now until May, 1951. They are sponsored by the university's extension division and the College of Engineering. Each is planned to give not only instruction of a basic nature, but information about latest developments and improved techniques in the field.

Subjects in the series will include: surveying, stress analysis of statically indeterminate structures, industrial safety engineering, motor vehicle fleet maintenance, tool engineering, testing and repair of electric meters, electric power plants, steam and hot water heating and air conditioning, highway institute (bituminous roads), municipal air pollution ordinances, nuclear technology, industrial product design, and traffic engineering.

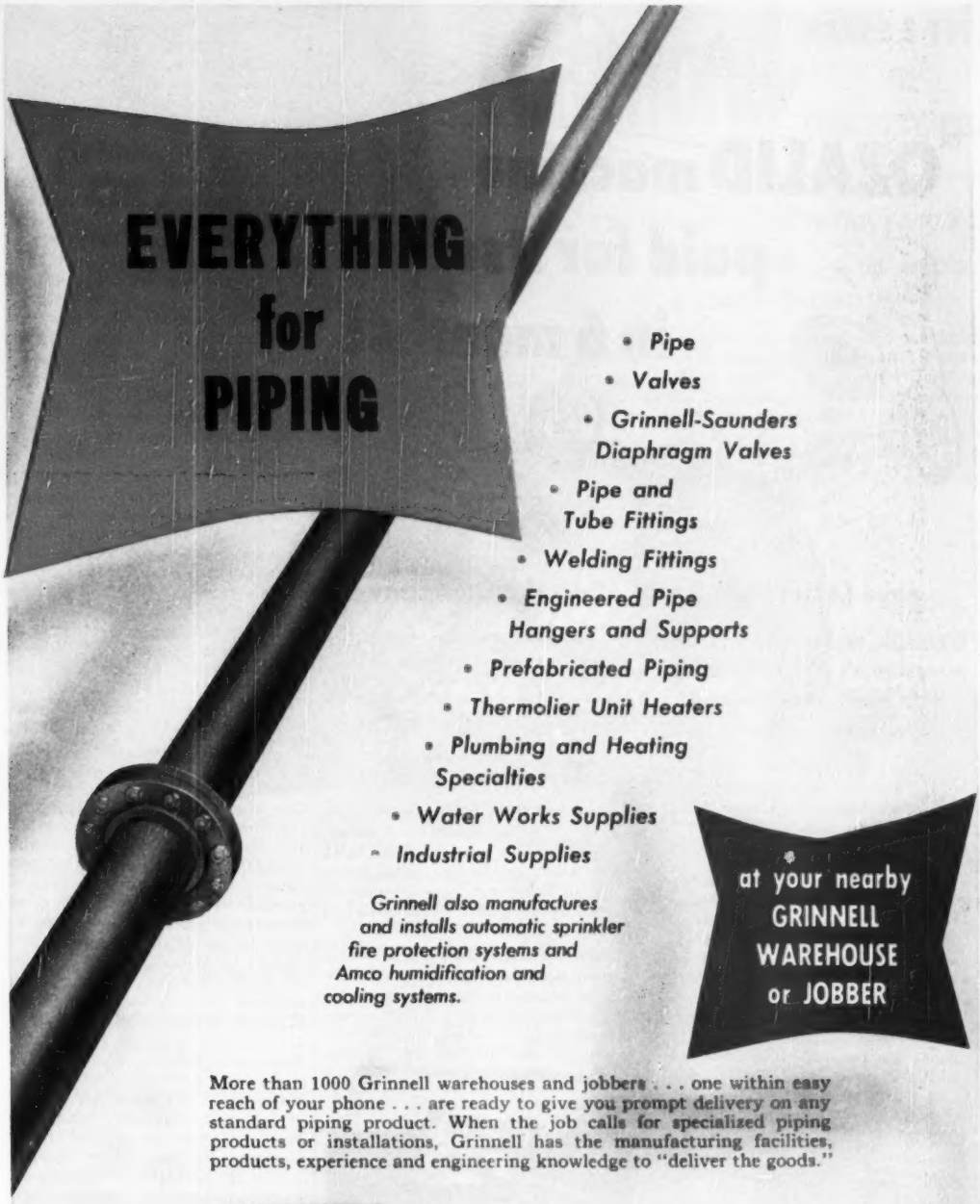
Prof. H. E. Pulver, of the extension division, is in charge of inquiries. The engineering staff includes Dean M. O. Withey, College of Engineering, and Profs. Pulver, Leonard F. Hillis, H. J. Kubiak, R. C. Tegtmeyer, and D. J. Barrington.

Seattle air pollution is being studied

A committee of four University of Washington departments has started an investigation of air pollution in the Seattle area, establishing a number of dust-collecting stations where there is the most serious contamination. Continuous air samples are taken from the meteorological tower on the Seattle campus and solar radiation is recorded for comparison with similar observations obtained at the Seattle-Tacoma airport south of the city.

The air pollution committee includes R. G. Tyler, professor of sanitary engineering, whose 1948 report on smoke abatement in Tacoma resulted in the appointment of an expert to carry on the city's program; F. B. Farquharson, director, and W. W. Philbrick, assistant director of the

(Continued on page 86)



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Engineering Experiment Station; Dr. P. E. Church, who heads the department of meteorology; and Dr. L. E. Powers, director, Dr. J. Leon Sealey, consultant, and A. W. Green, sanitary engineer, all of the Department of Public Health.

Landscape architecture—The department of landscape architecture, Graduate School of Design, Harvard University, offers to those eligible for admission as regular students a scholarship for the next academic year with an income of $600. Further information from the Chairman, Department of Landscape Architecture, Robinson Hall, Harvard University Cambridge 38, Mass.

Structural engineering—Prof. Ernest C. Harris, chairman of the department of structural engineering at Fenn College, Cleveland, Ohio has announced that the Fenn Society of Structural Engineers will sponsor a series of refresher courses for members of the association who plan to take the state examination in January, 1951.

Two groups of Milwaukee manufacturers have provided two University of Wisconsin third-year students in civil engineering with Scholarships of $1,000 each. The Lakeside Bridge and Steel Co. and the Milwaukee Society of Iron and Steel Fabricators provided the scholarships for Robert L. Sterna, Beloit, and Earl H. Reichel, Appelton.

Marble research—Edward R. Weidlein, director of the Mellon Institute, Pittsburgh, Pa., has announced that the National Association of Marble Producers has established in that institution a fellowship whose program of research is concerned with the development of specifications for marble for both outside and inside uses, with respect to suitability and durability for building purposes. The present incumbent of the fellowship is Marion P. Lelong, a graduate of VPI.

Professional problems—More than 150 seniors at the college of engineering, University of Wisconsin, are enrolled in a 1-credit course on "Professional Problems," planned by Prof. Henry Goehring, placement officer. A dozen leaders of business and industry are serving as teachers. The course will provide information concerning the responsibility of engineers to society, to their colleagues, and to the profession; interviewing techniques and use of placement services; examination and registration procedures for certification as professional engineers; opportunities, divisions of work, and requirements for engineers in many fields.

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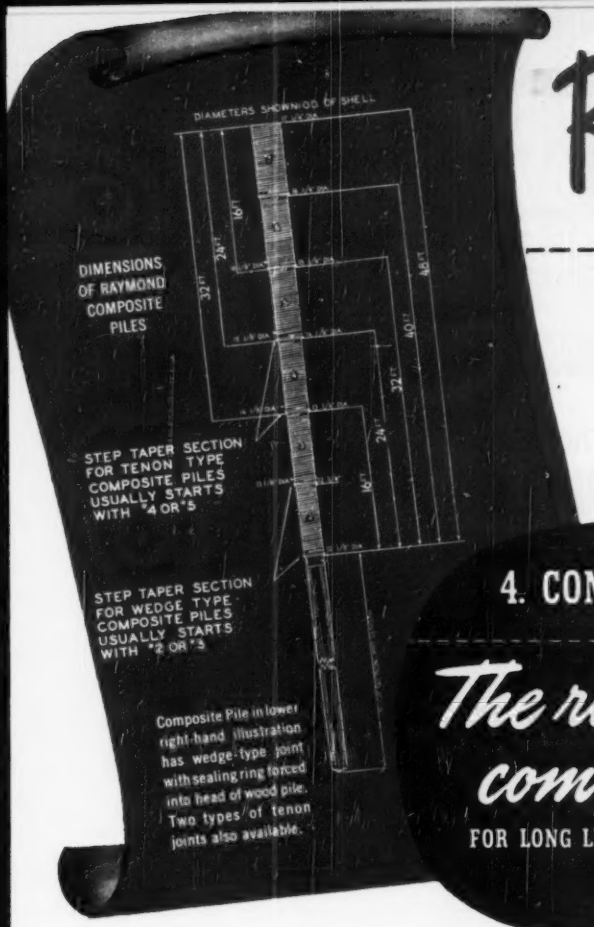
5. GOW CAISSONS

Raymond installs every type of pile: cast-in-place concrete, precast concrete, steel pipe, wood and H-beam. Raymond operations include underpinning; borings and soil investigations; waterfront construction and harbor and river improvements; also cement mortar lining of pipes by the Centriline Corporation, a Raymond Subsidiary.

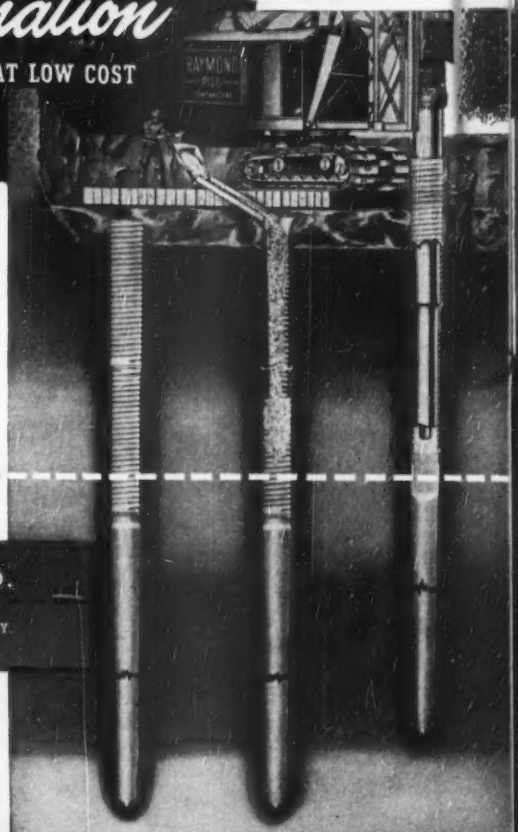

DIAMETERS SHOWN DO OF SHELL
DIMENSIONS OF RAYMOND COMPOSITE PILES
STEP TAPER SECTION FOR TENON TYPE COMPOSITE PILES USUALLY STARTS WITH #4 OR #5
STEP TAPER SECTION FOR WEDGE TYPE COMPOSITE PILES USUALLY STARTS WITH #2 OR #3
Composite Pile in lower right-hand illustration has wedge-type joint with sealing ring forced into head of wood pile. Two types of tenon joints also available.

4. COMPOSITE PILES

The right combination

FOR LONG LENGTH AT LOW COST

Right, driven wood pile is being followed down by pile shell of concrete section. Center, complete pile driven to resistance, pile shell is being filled with concrete. Joint, wedge-type with sealing ring, is below ground-water level. Completed pile is shown at left.



Raymond Composite Piles are used for economy and long length. The concrete upper section extends from the permanent water table up to the underside of the footing, thus eliminating the expensive excavation, sheeting and pumping often required with wood piles.

Raymond Composite Piles have solved many deep foundation problems permanently and at minimum final cost. We shall be glad to advise you, without obligation, whether they are suitable for your project.

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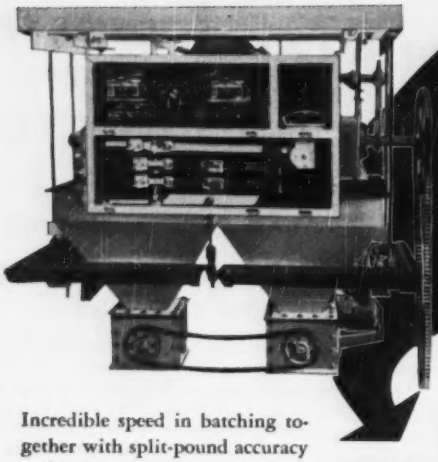

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Incredible speed in batching together with split-pound accuracy and fool-proof operation — that's the Dual Automatic Cement Batcher, a new triumph of BUTLER *Engineered Design.*

Almost twice as fast as single batching equipment, it weighs out and simultaneously discharges two batches in less than 35 seconds. And the Dual Automatic meets specifications in states where interlocked equipment is required.

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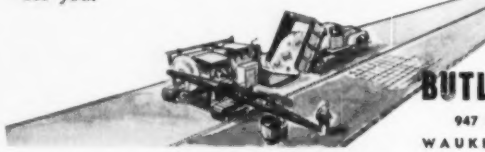
Shown in this new Bulletin are the latest in BUTLER Roadbuilders' Plants — the best in time-saving, efficient batching equipment. Send for your FREE copy. Ask for Bulletin 205.



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MEETINGS

With more than 500 in attendance at the convention of the Carolinas branch of AGC at White Sulphur Springs, W. Va., H. S. Crain, president of Crain & Denbo, Durham, N. C., was elected president. Other officers elected included G. P. Ballenger, Jr., Greenville, S. C., vice-president, and C. P. Street, Charlotte, N. C., treasurer. Directors elected included R. E. Fulmer, Columbia, S. C.; E. B. Towles, Wilmington, N. C.; Beaumert Whitton, Charlotte, and W. L. G. Mackenzie, Spartanburg, S. C. F. G. Heath, Raleigh, was re-elected chairman of the Associated Member Division. N. K. Dickerson, Jr., Monroe, N. C., retiring president, will be ex-officio member of the board.

A Morris County Chapter of the New Jersey Society of Professional Engineers was organized recently at a meeting of 75 professional engineers and land surveyors. Named temporary chairman of the chapter was George Kruger of Madison, vice-president of the national unit. Horace Patrick of Bernardsville was named secretary and Robert Budrick of Boonton, treasurer.

W. O. Jones, Ft. Worth city manager, has been appointed a member of the Texas Construction Council as representative of the Texas League of Municipalities. Other representatives appointed by Chas. H. Oehler, league president and Galveston city commissioner are: T. H. Conroy, Dallas director of public works; H. H. Stirman, Corpus Christi director of public works and George D. Barber, mayor of Mineral Wells. This council, is sponsored by the league, Texas Society of Professional Engineers, the municipal Contractors Association and the Texas Society of Architects.

Fred R. Seibert, St. Marys, Ohio, has been elected president and Lawrence L. Pilliod, Swanton, vice-president of the three-member board of directors of the recently-created 15-county Maumee Watershed Conservancy District. The third member is Otto C. Gohlke, Findlay, Ohio, Karl H. Weaner, Jr., Defiance, Ohio, has been named temporary secretary.

L. Dudley Field was elected president of the Monroe County Chapter, New York State Good Roads Association, at a meeting in Rochester, N. Y.

(Continued on page 92)

Need Big Front Tires Want Power Steering on your Motor Graders ?

Adams offers both in 4 popular models...

While the standard front tires on Adams Motor Graders are recommended for all average work, big front tires are sometimes indicated for work calling for unusual flotation.

The same with steering. Normally, Adams' standard mechanical steering is completely adequate. However, on continuous, heavy work, involving considerable turning, power steering can be advantageous.

That's why big front tires and power steering (either or both) are available on four new Adams models—at a total cost that represents more value to you than any other graders so equipped. See your local Adams dealer for complete information and prices.

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BIG FRONT TIRES AND POWER STEERING AVAILABLE ON THESE ADAMS MOTOR GRADERS

No. 610—With 100 H.P. Diesel Engine —Weight up to 27,000 Lbs.

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Make your next motor grader an Adams

It's Always 'Full Speed with the Busy BUCYRUS ERIE

FOR excavator service that combines dependability with speed, economy and efficiency, you'll find contractors all over the country prefer Bucyrus-Eries. Long experience has shown them that Bucyrus-Eries are reliable performers at any task — with easy convertibility that means the right front-end equipment for every job. They know, too, that unexcelled Bucyrus-Erie design provides the right combination of power, strength and responsive control that spells big, low-cost output — shift after shift, year after year. Choose from the complete Bucyrus-Erie line of ⅜- to 4-yard gasoline, diesel and single-motor electric excavators for "full speed ahead" performance on your shovel, crane, dragline, clamshell or dragshovel jobs!

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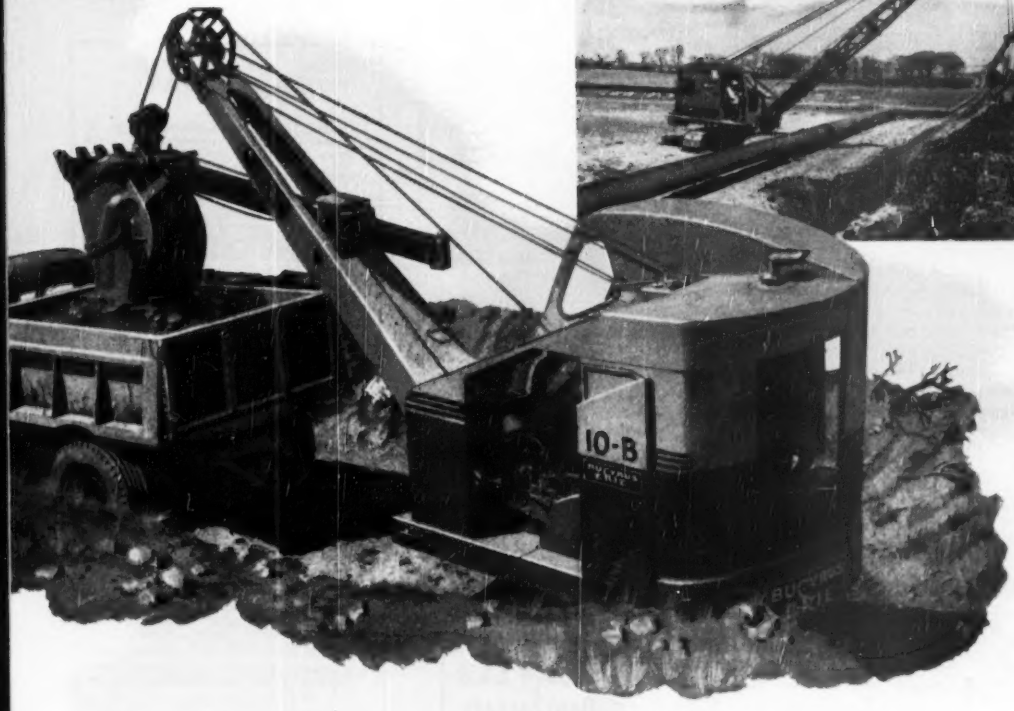

10-B ⅜-YD. **15-B** ½-YD. **22-B** ¾-YD. **38-B** 1½-YD. **51-B** 2-YD. **54-B** 2½-YD. **88-B** 4-YD.

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UNIT 614—½ Yd. 25 years of engineering skill and craftsmanship have gone into the production of this outstanding model. It offers the same rugged construction usually found only in machines of greater capacity. Compare its construction, features and design with any ½ yard machine in the market today. Get the facts—Write today for literature.

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Saxe Units place in position and securely hold together structural parts to be welded.

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Other officers: Arthur A. Davis and Donald Malcolm, vice presidents; Arthur Fear, secretary, and H. W. Tripp, treasurer.

The Michigan Section of the American Waterworks Association has named the following officers: Chairman, George Hazey, Wyandotte; vice-chairman, Lewis E. Ayres, Ann Arbor; secretary and treasurer, T. L. Vander Velde, State Health Department; and trustee, H. E. Smith, Adrian.

Organization of the Society of Fire Protection Engineers, a new, professional section of the National Fire Protection Association, is announced. Its object is to promote the professional standing of fire protection engineers. Qualifications for membership, dues and the functional activities will be on a par with other professional engineering organizations.

CALENDAR

Building Industry Employers of N. Y. State, BTEA Clubrooms, 2 Park Ave., New York City, Dec. 14-16.

Highway Research Board, National Research Council, annual meeting, Washington, D. C., Jan. 8-12.

American Society of Photogrammetry, annual meeting, Shoreham Hotel, Washington, D. C., Jan. 10-12.

N. Y. Section AWWA, luncheon meeting, Park-Sheraton Hotel, New York City, Jan. 16.

Industry—College Conference, Case Institute of Technology, Cleveland, Ohio, Jan. 20.

National Association of Home Builders, annual convention and exposition, Stevens and Congress Hotels, Chicago, Ill., Jan. 21-25.

Conference, Wisconsin County Highway Commissioners and County Highway Committee Members Association, Milwaukee, Wis., Jan. 23-25.

Third California Conference on Street and Highway Problems, University of California, Berkeley, Jan. 24-26.

Associated Equipment Distributors, annual meeting, Stevens Hotel, Chicago, Ill., Jan. 28-Feb. 1.

Midwinter Housing Conference, S. W. Research Institute's division of Housing and Construction Technology, Statler Hotel, Washington, D. C., Feb. 13-14.

American Concrete Institute, St. Francis Hotel, San Francisco, Calif. Feb. 20-24.

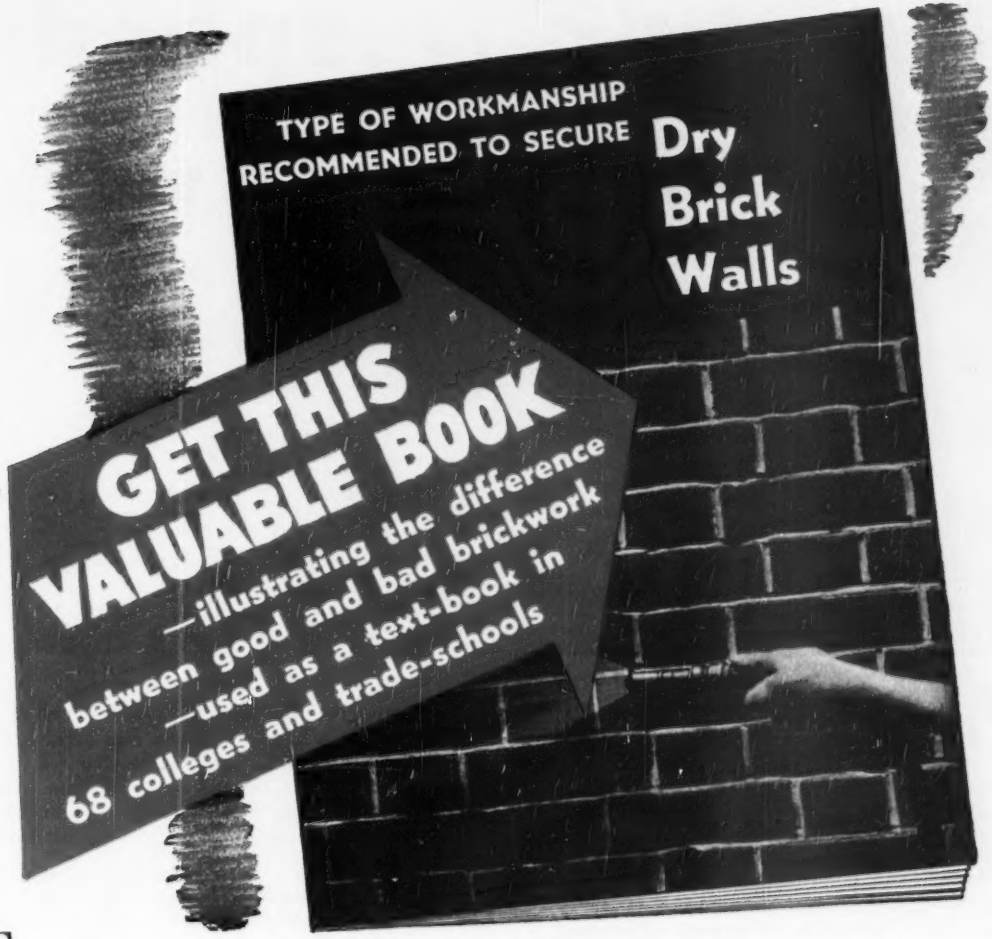
Industrial Waste Conference, Purdue University, La Fayette, Ind., Feb. 21-23.

American Road Builders Association, Schroeder Hotel, Milwaukee, Wis., March 12-14.

American Railway Engineering Association, Chicago, Ill., March 13-15.

N. J. Sewage and Industrial Wastes Association, Haddon Hall Hotel, Atlantic City, N. J., March 14-16.

N. Y. State Association of Highway Engineers, Rochester, N. Y., March 28-30.



FOR many years intensive research on the cause and prevention of leaky brick walls has been conducted by various organizations and individuals, and much vital information has been gathered.

Most authorities agree that *workmanship* is the most important thing involved, but until now, no one has attempted to explain and *illustrate* the difference between good and bad workmanship.

"*Type of Workmanship Recommended to Secure Dry Brick Walls*" does just that. In it, a recognized authority on brickwork has compiled 16 pages of proven information—explanations and recommendations—96 color illustrations. It is a major contribution to *good building*. It is *not* an advertisement for our product, Brixment. It is published as a *service* to the building trades. It will be sent free to any architect, contractor, bricklayer or dealer who is interested in water-tight masonry.

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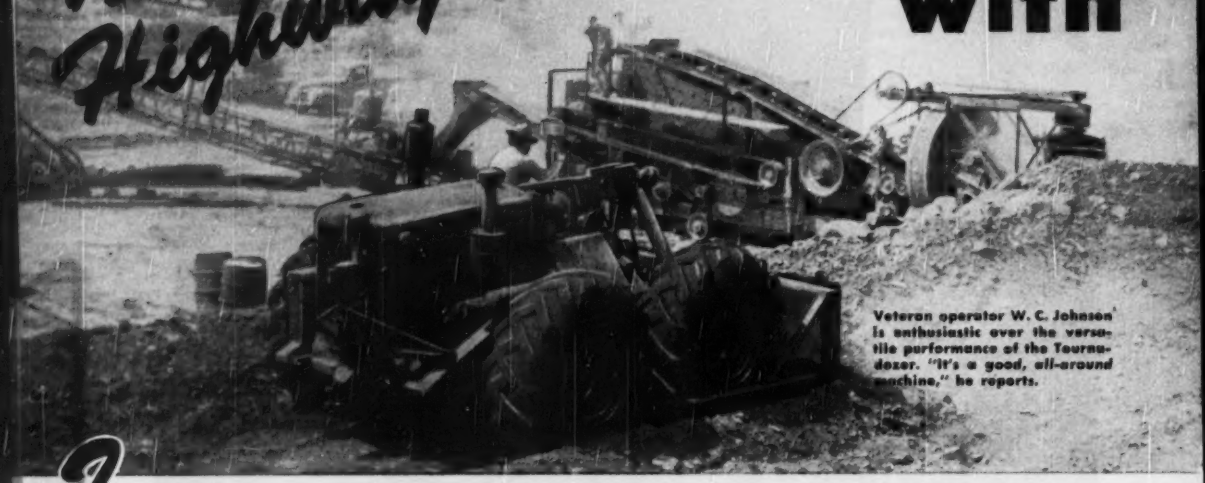


Veteran operator W. C. Johnson is enthusiastic over the versatile performance of the Tournadozer. "It's a good, all-around machine," he reports.

In Southwestern New Mexico, Division One of the State Highway Department is handling a number of scattered road maintenance tasks with a high-speed, rubber-tired C Tournadozer. In the past year, the versatile "C" has satisfactorily completed a wide variety of jobs like these:

Clears rock slides, builds detours

Last fall, flash floods piled up debris on U.S. Highway 260 near Cliff. The mobile LeTourneau rubber-tired Dozer was dispatched from Division Headquarters at Deming, drove 84 miles over mainline roads . . . went to work the moment it arrived . . . and soon re-opened the route to traffic. From Cliff, the high-speed Tournadozer rolled east along the Black Range Highway (State 180) to clean up a number of heavy rock slides which couldn't be handled with a motor grader. Next, the versatile "C" drove to a site near the upper Rio Grande River, where it opened a detour to bypass a burned-out road bridge.

Feeds portable rock crushing plant

Recently, the Tournadozer has been teamed with a portable rock crushing plant on highway resurfacing work between Las Cruces and Albuquerque. Here, the State is using ¼" rock chips to seal-coat 228 miles of U.S. 85. Material is being borrowed from pits spotted along the right-of-way. Tournadozer has been assigned the feeding work . . . and has helped maintain a high production rate by digging up and delivering all the bed rock and gravel the crusher can handle. Over 100 miles of road have been resurfaced within the past several months . . . and work is progressing continuously at a fast rate.

Tournadozer's ability to go anywhere, any time, has helped finish all these New Mexico highway maintenance tasks on or ahead of schedule. Big 21.00x25 low-pressure tires enable the powerful "C" to work in loose sand or soft muck . . . then drive from job-to-job over paved highways or cross-country. No waiting for trailer . . . no loading or unloading delays. Operator just hops on this big Dozer and GOES. Heavy-duty, 4-wheel air brakes let him highball down steep mountain grades and around narrow curves with complete confidence and safety. Fast forward speeds, fast reverse, and constant-mesh transmission save time every dozing cycle. Across the entire country, Tournadozer is consistently out-producing crawlers, often 2 and 3 to 1.

Get all the facts today

Ask your local LeTourneau Distributor for a complete picture of the savings possible on *your* dozing jobs with a "C" or smaller D Tournadozer. Call him . . . or write TODAY!

Mail now to: R. G. LeTOURNEAU, Inc., Peoria, Illinois

NAME_____

TITLE_____

COMPANY_____

STREET_____

CITY, STATE_____

Please send us more information on:

- ☐ 19 m.p.h. C Tournadozer
- ☐ 19 m.p.h. D Tournadozer

for use with

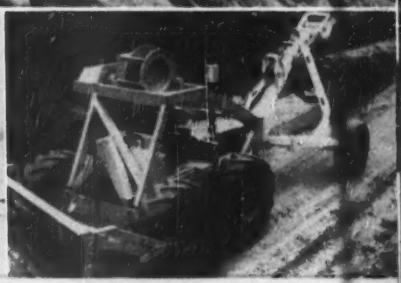
- ☐ Bulldozer
- ☐ Angledozer
- ☐ Snow Plow
- ☐ Root Rake
- ☐ Side-Boom Crane
- ☐ Logging Winch
- ☐ Carryall Scraper
- ☐ Rollers, Rooters

road maintenance
C TOURNADOZER

INTERCHANGEABILITY
These auxiliary C Tournadozer tools assure steady earnings the year around: (Similar tools are available for "D")

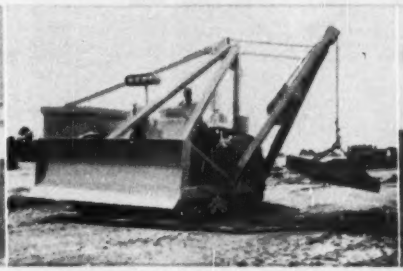
ANGLEDOZER — For extensive sidehill work, Tournadozer's regular Bulldozer is easily interchanged with Angledozer. 13'x 41½" blade can be angled 20° right or left . . . optional electric motor tilts either corner of blade 10" up or down.

ROOT RAKE — Low-cost, specialized tool for handling brush clearing with Tournadozer. Husky 11'8" x 3'4" rake has 10 curved teeth of 4" high-grade, heat-treated steel, placed 9" apart, for grubbing out roots, raking aside rocks.



LOGGING WINCH — Tournaskidder puts both ends of Tournadozer to profitable use. Standard 11'2"x45" bulldozer mounts on front . . . heavy-duty electric control Winch mounts on top, develops 50,000-lb. line pull for skidding pipe, snaking logs, etc.

SNOW PLOW — Has 12'3" clearing width . . . flows snow 6½' high off ends of V-type plow-share blade. Vertical divider plate eliminates plowing snow back on road when widening. Adjustable runner shoe and big tires protect pavement surface.

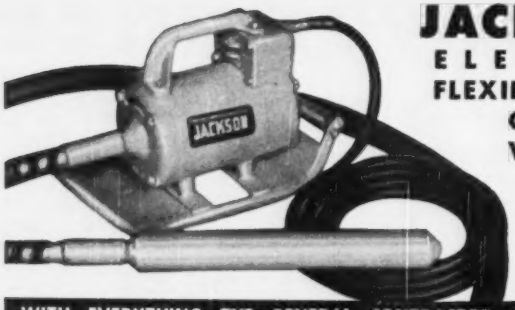


SIDE CRANE — Reaches out to 12' . . . lifts 14 tons up to 12' with boom raised . . . 5 tons in maximum reach position. Fingertip electric controlled. Maneuvers, spots "on a dime" . . . works, travels anywhere . . . on pavement . . . through mud or sand.

CARRYALL SCRAPER — Tournadozer's faster speeds make it a big-yardage prime mover with electric-control 13.5-yd. E-16 Carryall Scraper or cable-operated 11-yd. LS Carryall. Tournadozer also pulls Rooters, Sheepsfoot Rollers, other heavy equipment.

LETOURNEAU PEORIA, ILLINOIS — JOB-PROVED The World Over — **TOURNADOZERS**

IT'S RUBBER THAT PUTS THE ACTION IN TRACTION



JACKSON
ELECTRIC FLEXIBLE-SHAFT CONCRETE VIBRATOR

MODEL FS-150A

WITH EVERYTHING THE GENERAL CONTRACTOR COULD WANT

POWER GALORE: 2½ HP (continuous duty rating) Universal Motor provides more than ample power for uninterrupted placing of the stiffest mixes using the maximum length of shaft.

LIGHT SOCKET OPERATION: Wherever either 115 volt, 60 cycle single phase AC or Direct Current is available, this relatively inexpensive vibrator will do a bang-up job of concrete placement.

28 FOOT REACH: Available with any length of shaft up to 28 feet. Maximum length makes hard-to-get-to places readily accessible — saves time by making frequent changes of vibrator location.

CONVENIENT — RUGGED CONSTRUCTION: Double grip, skid-base handle with finger-tip control switch. Weighs only 50 lbs. Finest, smooth-running flexible shaft and fittings — built to take the most severe usage.

GRINDING: Countershaft attachment for quick conversion to wet or dry concrete rubbing.

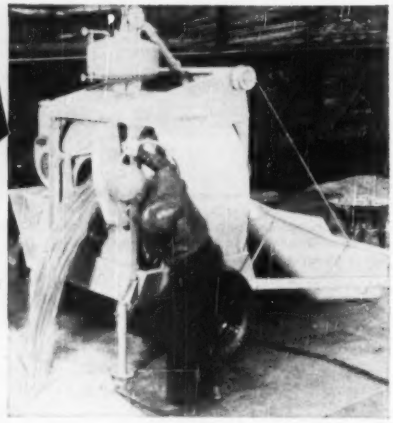
HIGH FREQUENCY — 3 VIBRATOR HEADS: 8,000 to 10,000 VPM and availability of three vibrator heads assure rapid as well as thorough consolidation of the stiffest mix concrete under all conditions.

See this outstanding general-purpose electric vibrator at your Jackson Distributor or write for complete facts.

ELECTRIC TAMPER & EQUIPMENT CO.

LUDINGTON, MICHIGAN

Re-Mixer Drum Empties in *7 Seconds*



This Mixer is WISCONSIN-POWERED!

Discharging a 12.1 foot concrete batch in 7 seconds with only 2 revolutions of the drum of this KWIK-MIX Dandie Mixer, made by Kwik-Mix Co., Port Washington, Wis., requires excellent drum design . . . dependable power such as furnished by its Wisconsin Heavy-Duty Air-Cooled Engine.

Wisconsin Engines are equal in dependability to the finest units they power, because of such features as tapered roller bearings at both ends of the crankshaft taking up all thrusts . . . fool-proof any-climate air-cooling . . . and an easily-serviced OUTSIDE magneto with impulse coupling for quick any-weather starting and running, to name a few. Features such as these put equipment to work sooner . . . keep equipment at work longer . . . adding up to more machine hours and less man hours on the job . . . more profits through less cost. Write for details. 4-cycle, single-cylinder, 2-cylinder, and V-type 4-cylinder models, 3 to 30 hp.

WISCONSIN MOTOR CORPORATION
World's Largest Builders of Heavy-Duty Air-Cooled Engines
MILWAUKEE 46 WISCONSIN

OBITUARY

William C. Goers, 73, for many years superintendent of sewer maintenance for Cleveland, Ohio, died Nov. 6. He joined the city service department in 1910, filling various posts until he retired in 1947.

John Lewis Thomas, 71, retired engineer at Seattle, Wash., died there Nov. 16. He was a bridge engineer with the city until his retirement seven years ago.

A. Lyle Prather, 62, retired engineer, died at Ventnor, N. J., Nov. 19. A 1909 graduate of Cornell University, he served as a construction engineer on the Panama Canal, later becoming general manager of the Panama Railroad Co.

H. L. Weaver, 58, civil engineer and landscape architect, died at Baltimore, Md., Nov. 17. He was a graduate of the Polytechnic Institute.

Robert F. Sealey, 64, former construction engineer with the American Bridge Co., died at Rock Hill, S. C., Nov. 19.

William Jarrett, 89, retired for 25 years, former installation engineer for the Black and Clawson Co., Hamilton, Ohio, and one time in charge of the Mansfield, Ohio, water works, died Nov. 7, in Miamisburg, Ohio.

Ralph C. Young, 82, Toledo, Ohio, retired construction engineer, died Nov. 10. He had charge of several major construction projects in the East and in Michigan before his retirement 15 years ago.

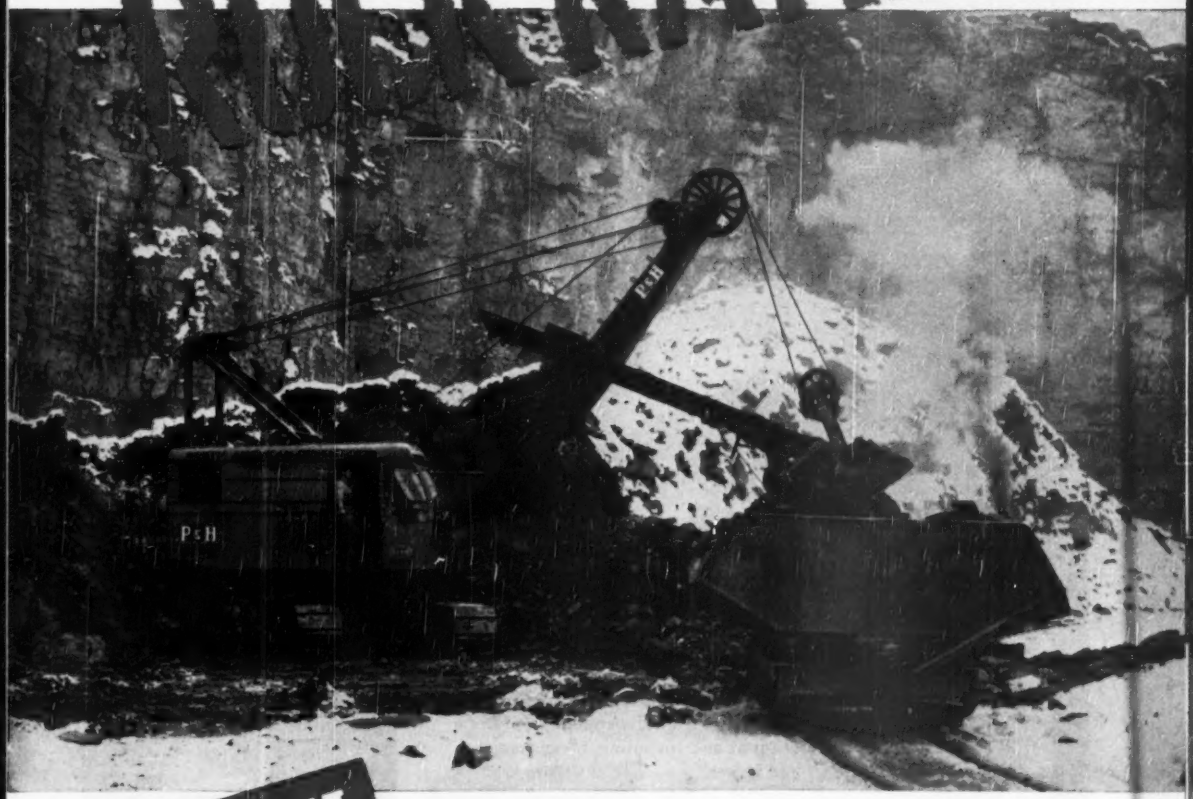
Harry Gracemyer, 57, chief engineer of the city waterworks at Toledo, Ohio, for the last 15 years, and employed by the city for 33 years, died Nov. 9.

George W. Bean, 75, who in 1900 was appointed chief Army Engineer of sanitation for Cuba, serving under Gen. Leonard T. Wood, died Nov. 20 in Washington, D. C.

Lt. Col. Francis Alfred Wilkin, 78, retired University of British Columbia civil engineering professor, died at Vancouver, B. C., Nov. 11. He retired in 1941 after more than 20 years in the UBC engineering department. He was graduated from McGill University in 1895, and served as locating engineer for the Canadian Pacific Railway

(Continued on page 99)

ROCK RATED!



THE NEW P&H MODEL 955-A (2½ YDS.)

with *MAGNETORQUE** swing

Watch this new machine get its teeth into a rock job and see what "rock-rated" really means to you. It's *designed* . . . every inch from boom point to crawler shoes . . . to make rock handling easier . . . more profitable for you.

Unbeatable—point for point

P&H Magnetorque eliminates swing friction clutches . . . their troubles and replacement costs. It gives you smoother, faster swings . . . for the life of your machine.

Greater Stability gives you more power at the tooth point . . . and greater work capacity.

Direct Acting Hydraulic Control . . . easier on machine, easier on operator . . . smoother and greater holding power through full wrap brakes and clutches.

*Trade-Mark of Harnischfeger Corporation for electro-magnetic type clutch.

P&H Rapid Reversing Planetary Chain Crowd gives you snappier dipper action. It's more accurate. And crowd chain outlasts 25 to 30 crowd cables.

Get the facts about P&H all-welded strength and Added Values! The 955A is a 2½ yd. version of the P&H 1055 (3 yd. shovel) . . . the machine that has set new low-cost production records everywhere. Write for Bulletin X122, today.

P&H EXCAVATORS
4404 West National Ave.
Milwaukee, Wisconsin

HARNISCHFEGER CORPORATION

EXCAVATORS • OVERHEAD CRANES • HOISTS • ARC WELDERS and ELECTRODES • SOIL STABILIZERS • CRAWLER and TRUCK CRANES • DIESEL ENGINES • CANE LOADERS • PRE-ASSEMBLED HOMES

Dig and dump . . . speed the cycle . . . take those shocks . . . *stay on the job*—that's the big order you give a hoist rope. To have it filled, put *Preformed* Yellow Strand Hoist Rope on your power shovel. Specify Lang Lay with Independent Wire Rope Core—6 x 19 for ropes up to and including 1″ in diameter, 6 x 41 for sizes 1⅛″ and larger.

In *Preformed* Yellow Strand, whatever the construction, internal stresses have been relaxed. You gain with longer rope life, fewer shutdowns for replacement, more production for your rope dollar. Call your B & B distributor now so you'll have a real *working* rope on hand when it's time to change your hoist, drag, scraper or other heavy-duty line.

Broderick & Bascom Rope Co., St. Louis 15, Mo.

Branches: New York, Chicago, Houston, Los Angeles, San Francisco, Portland, Seattle *Factories:* St. Louis, Peoria, Houston, Seattle

BRODERICK & BASCOM

Yellow Strand

PREFORMED WIRE ROPE

from 1901 to 1905 west of Winnipeg and later as reconnaissance engineer. He served overseas in the first World War with the First Canadian Motor Machine Guns, won the Military Cross at the Somme in 1916. He joined the University of B.C. staff after going to Vancouver in 1918.

Victor N. Strong, 63, a construction engineer in Buffalo, N. Y., for many years, died Nov. 23. He had been with various construction firms in Buffalo, including the Buffalo Shipyards and the Herbert Darling Construction Co.

William H. Kinch, 91, pioneer in the sewer, asphalt and construction industry in Buffalo, N. Y., died Nov. 19. For many years he was president of the Rock Asphalt & Construction Co. Inc. of Buffalo, now known as Rock Asphalt, Inc. Mr. Kinch was also a key figure in the Colvin Meadows Building Corp. which installed sewers and water lines. He was president of Canadian Bituminous Paving Corp. which laid 100,000 yd. of paving in Halifax, N. S., in 1919 and 1920.

Frank T. Leilich, 65, consulting engineer, died Nov. 19 in Baltimore, Md. He taught engineering at the University of Pittsburgh until he joined the Army Engineers in World War I. In the second World War, Colonel Leilich served with the 121st Engineers and in 1942 he became commanding officer of the 135th Engineers in the British West Indies and the U.S. He became post engineer at Fort Belvoir, Va., and was C.O. of the 2571st Regiment there.

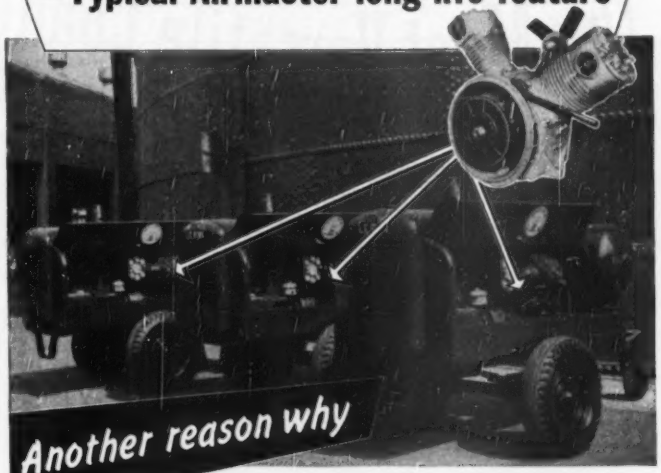
Three-year sewer project gets needed financing

Work on the $8,000,000 sewer interceptor project in Wilmington, Del., will start about March 1, 1951, Chester R. Jones announces for the Wilmington Street and Sewer Department. The project will take three to three and a half years to complete.

The work start of the sewer interceptor system project became possible when Wilmington City Council approved a resolution to borrow $600,000 to cover the cost of the first six months' work.

Timetable for the work has been set up by street and sewer department engineers with the aid of Whitman, Requardt and Associates, consulting engineers of Baltimore, Md. Work on interceptors A, B and E will begin this March; the other interceptors, C and D, will be started late in 1951. A pumping station and large treatment plant will also be started late next year.

300% Overload Rating on Clutch —Typical Airmaster long-life feature



Le Roi Airmaster Compressors produce more air for less money

WHEN you buy a Le Roi Compressor, the pay off is in *extra* service hours. Le Roi's can take it. For example, the 300% overload rating on the clutch provides protection against on-the-job failure.

You find other extra margins of safety — extra sturdy running gear, solid protective housing, heavy-duty engine-compressor units — that show up in *extra* service hours.

Be sure to use a compressor that won't let you down—that produces more air for less money. Sizes from 60 to 600 Cfm. Ask your distributor for more about Le Roi's "long-life" design or write us for bulletins that tell the story.

... and Le-Roi-Cleveland air tools cut costs still more

Experienced distributors everywhere to give prompt service on the job!

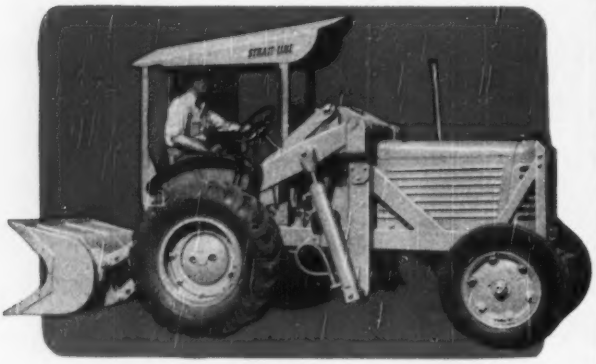
C-124

LE ROI COMPANY

MILWAUKEE 14, WISCONSIN

NEW YORK • WASHINGTON • CLEVELAND • BIRMINGHAM • TULSA • BUTTE • SAN FRANCISCO

Now... *the Most Versatile Loader on Wheels!*



Here's the most versatile, practical loader ever developed for wheel tractors. It can dig in front . . . dump in front like the conventional loader. BUT, it can also dig in *back* and load in *front*.

You can dig in back . . . move straight forward to the truck . . . the bucket swings *straight over* the roof . . . and the load is dumped into the truck. Thus you eliminate the turning necessary with ordinary front end loaders . . . eliminate *half* the gear shifts and *half* the clutch wear. You save time and fuel . . . cut operator fatigue. You speed loader operations . . . *can load at better than a yard a minute.*

You get far greater traction and almost effortless steering with the Strait-Line. Rear-carried bucket load adds needed weight to the rear driving wheels . . . subtracts weight from the front steering wheels. Increased traction plus the new PUSH-TILT bucket with extended loading lips, enables you to get bigger bucket loads. Two levers control all operations.

Add them all up . . . ability to select your type of digging, front or back as the job requires . . . Strait-Line operation with back digging which gives you faster operation, greater traction and easy steering . . . fuller buckets . . . and you'll see where your operations can profit with the Strait-Line. For information and literature, see your Oliver Industrial Distributor or write direct to The OLIVER Corporation, 19300 Euclid Avenue, Cleveland 17, Ohio.

Conventional front digging, primarily used with Strait-Line where unit digs and moves straight ahead to load.

Back digging. Note how extended loading lips easily penetrate the bank.

PUSH-TILT action which lifts cutting edge 20" and thrusts it into bank.

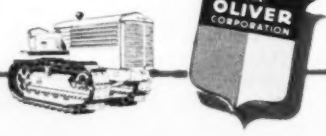
Carrying position—bucket is tilted to retain load and is carried low enough to increase both traction and stability.

Dumping position. Bucket has been carried over the roof and dumps in front.

THE OLIVER CORPORATION

A complete line of industrial wheel and crawler tractors

"FINEST IN INDUSTRIAL MACHINERY"



The Sign of Extra Service

MATERIALS AND LABOR PRICES

Market quotations on construction materials and wage rates reported monthly by ENR correspondents
January Materials, and Labor Prices will appear in the January 11, 1951 issue

CEMENT, AGGREGATE, READY-MIXED CONCRETE—F. O. B. CITY

	PORTLAND CEMENT* Per bbl. C/L lots cash. dis. not deducted			SAND AND GRAVEL Per ton, carload lots			CRUSHED STONE Per ton, carload lots		CRUSHED SLAG Per ton, carload lots, f.o.b. plant		CONCRETE BLOCK 8 x 8 x 16-in.; truckload del.; per block		CONCRETE Ready Mixed 1:2:4, over.
	Paper	Bulk	Mortar	Gravel, 1½ in.	Gravel, ¾ in.	Sand	1½ in.	¾ in.	1½ in.	¾ in.	Sand	grav. Lt. wgt. agg.	50 c.y., del.
Atlanta	$3.63	$3.35	3.10	$2.00	$2.00	$1.75	$2.10	$2.10	$1.65	$1.85	$0.186	$0.186	$11.00
Baltimore	3.51	3.24	3.27	2.40a	2.40a	1.95a	2.60a	2.70a	2.45a	2.45a	.17	.17a	10.50
Birmingham	3.00	2.68	3.80g	2.24	2.24	1.84	2.50	2.50	1.00	1.20	.145	.145	7.75
Boston	3.79	3.51	....	2.50a	2.50a	2.50a	1.60a	1.70a	....	....	.206	.22a	10.45h
Chicago	3.11	2.84/3.23	....	2.75‡b	2.75‡b	3.40‡b	2.75‡b	2.75‡b	2.00‡	2.00‡	.22	.22b	11.00
Cincinnati	3.46	3.18	3.16	2.15‡c	2.40‡c	2.05‡c	2.00‡A	2.00‡A	1.80	1.80	.20	.205	10.95f
Cleveland	N. A. in C. L.			1.90ef	1.65f	1.55	3.65a	3.65a	2.85‡	2.85‡	....	.22	13.00g
Dallas	2.81	2.54	2.70	2.00	2.15	1.75	2.10	2.15	....	....	.080e	.125	9.30
Denver	3.74	3.40	3.45	1.85	2.00	1.15	....	....	....	....	.20	.23a	9.75
Detroit	3.12f	2.85	2.91	4.00‡b	4.00‡b	3.50‡b	3.85/4.00‡	3.85/4.00‡	4.00‡	4.00‡	.18	.19a	10.10f
Kansas City	3.25	2.98	....	1.90	1.90	1.50a	1.95a	1.95a	....	....	.175ag	.213e	10.40‡b
Los Angeles	3.80a	3.40a	4.60	2.05a	2.15a	1.90a	2.05a	2.03a	....	....	.11f	.215	10.15Am
Minneapolis	3.55cd	3.27cd	3.20	2.30ag	2.30ag	1.35ag	2.40‡ag	2.40‡ag	....	....	.23a	....	11.55fi
Montreal	2.65ac	2.51ac	....	.....	.....	1.90e	.85ej	1.10ej	....	....	.22	.30a	9.05ek
New Orleans	3.08e	2.80e	3.00	2.32	2.32	1.82	....	....	1.05	1.25	.25	....	12.90
New York	3.61	3.34	3.22	2.35kk	2.35kk	1.45kk	2.35bl	2.35bl	....	....	....	....	11.15an
Philadelphia	3.25/3.55‡	2.97/3.27	3.25 ‡	2.58‡	2.65‡	2.05‡	2.00‡	2.05‡	1.75	1.65	.22/.25	....	11.15
Pittsburgh	3.32	3.04	....	2.05‡	2.05‡	2.00‡	2.50‡	2.50‡	2.05	2.05	.22d	.22d	11.00
St. Louis	3.14/3.25b	2.89/2.95b	4.00	2.55/2.60am	2.60am	2.15/2.60am	1.50j	1.50j	1.15	1.15	.215	.25cs	10.15
San Francisco	3.39	2.99	....	1.86	1.86	1.96	1.96	....	....	....	....	.26e	10.75e
Seattle	3.75a	3.25a	3.85	3.00‡bm	3.00‡bm	3.00‡bm	3.50‡bm	3.50‡bm	....	....	.24j	.3325g	10.95f

‡ Delivered. * Prices incl. dealers comm. except as noted.
CEMENT: a Subj. to 10¢ dis. b Less 2% for cash. c CL price dealers' comm. not incl. d Dealers sell only LCL. e Plus switching charges. f Paying up to $3.80 for cement brought in from outside sources. g LCL.
SAND, GRAVEL, STONE & SLAG: a Truck lots. b Per cu. yd. c 5 tons or more. e ½". f Pea gravel. g Less 5% for cash. h Less than 5 tons. i Sales tax incl. j F.o.b. quarry. k Barge lots ind. l F.o.b. scow Hudson river. m Less 2% for cash.
CONCRETE BLOCK: a Cinder. b Waylite. c Haydite. d Celocrete. e 5⅓ x 8 x 12 in. f 8 x 4 x 16. g F.o.b. truck at job. i Less 2% for cash. j Less 1% for cash.
READY MIXED CONCRETE: a 5 cu. yds. or over del. Man. b 25 cu. yds. or more. c 10–100 cu. brackets. e 2,000 lb. concr. f 2500 lb. comp. g Aver. haul 7–9 mi. sone. h Less 50¢ for cash. i 5% off for cash. j 2% off for cash. k Sales tax included. l 1:2½:4. m F.o.b. yard. n Plus escalator clause.

CASH DISCOUNTS CEMENT to Contractors: Truck delivery, 2% for cash on 10th of month; on carload deliveries, no trucking, same as dealer cash discount 10c. per bbl. for payment within 15 days of date of invoice. Subject discount 10c. per bbl. 20 days in Montreal.

CURRENT MAXIMUM PRICES AT CEMENT MILLS

Charge for bags not included. For paper bags add 27¢ per bbl., not refundable

	Bulk		Bulk		Bulk		Bulk		Bulk
Richard City, Tenn	$2.50†	Buffington, Ind	$2.40†	Steelton, Minn	$2.50†	Muskegon, Mich	$2.60†	Toledo, O	$2.50†
Clinchfield, Ga	2.50†	Independence, Kan	2.40†	Leeds, Ala	2.35†	Saginaw, Mich	2.45†	Milwaukee, Wis	2.60†
Kingsport, Tenn	2.50†	Hannibal, Mo	2.45†	Duluth, Minn	2.50†	Wyandotte, Mich	2.50†	Green Bay, Wis	2.60†
West Des Moines, Iowa	2.55†	Northampton, Pa	2.50†	Hudson, N. Y	2.50†	Buffalo, N. Y	2.50†	Ironton, O	2.50
Nazareth Pa	2.50†	Universal, Pa	2.50†	Alpena, Mich	2.35†	Oswego, N. Y	2.50†	Montreal City	2.31
Bath, Pa	2.50†	Waco, Tex. (+ 10¢ tax)	2.40†	Detroit, Mich	2.50†	Cleveland, O	2.50†	W. Winfield, Pa	2.50†

†*Prices to hold for fourth quarter of* 1950

PAVING BRICK, BLOCK, ASPHALT, ROAD OILS—F. O. B. CITY

	PAVING BRICK AND BLOCK			PAVING ASPHALT Per ton, less than 80 penetration		ASPHALT BINDERS—FLUXES Per gal., 80–300 penetration		CUTBACK ASPHALT Per ton		ROAD OIL Per gal.	ASPHALT EMULSION (Quick-breaking) Per gal.	
	Granite Per M lots of 50,000 4x4x8 in.	Brick Per M 3x4x8¼ in. carload lots	Wood per sq. yd. 3½ in. 16-lb. treat	Tank car	Drums	Tank car	Drums	Tank car	Drums	Tank car	Tank car	Drums
Atlanta	$73.00	$35.00	$2.25	....	....	....	....	....	....	....	....	....
Baltimore	150.00‡	57.70‡	.....	$20.00	.....	$.0809	$0.14	$.08	$.16	$.08a	$.08	$0.11
Birmingham	.....	32.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Boston	.....	.....	.....	24.50a	$35.50a	.1036a	.185a	.115aw	.205aw	.10a	.113a	.205a
Chicago	135.00‡a	90.00‡b	4.15/4.50‡f	20.25b	30.25b	19.25bw	29.25bw	.0875bw	.16bw	.075b	.....	.....
Cincinnati	.....	.....	.....	21.50k	....	.095	.095	.095w	....	.....	.....	.....
Cleveland	.....	51.00d	4.33g	26.50	38.50	26.50c	38.50c	.12w	.24w	.11	.125	.28
Dallas	e	40.00	e	23.95	42.99	.1012	.1398	26.99	47.97	.0987	.1062	.1423
Denver	.....	48.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Detroit	.....	88.00	.....	26.65	....	12.00e	.....	.0976w	.....	.0971	.....	.197
Kansas City	e	e	e	18.55el	17.55	.....	.....	.0725ew	.075w	.0635c	.....	.....
Los Angeles	e	.....	e	14.00dm		14.00dr		15.50d		14.00dr	.0825j	.1625j
Minneapolis	.....	.....	2.83A	26.00	36.50	24.50e	35.50e	24.50	35.50	.0925	.1225	.2225
Montreal	137.00	e	e	27.00n	36.65n	16.70nu	18.50nu	16.30nu	18.30nu	13.20ns	.184ns	.225ns
New Orleans	.....	.....	.....	16.50e	.....o	16.50er	.....o	.08ew	.....o	.0775	.08	.1425t
New York	.....	.....	2.75f	23.50	25.86q	22.50e	41.88qs	.0940w	.1767qw	.0890	.0940	.1747q
Philadelphia	150.00	110.00	4.06	20.50	.....	19.50e	.....	.085w	.....	.....	.....	.....
Pittsburgh	165.00	44.00	4.50	22.00	35.00	.10	.20	27.00	39.00	.095	.09	.20
St. Louis	.....	.....	.....	19.25f		.1633	.....	.0841w	.....	.18	.....	.....
San Francisco	.....	63.73e	.....	14.50g	30.00gp	14.50gkr	.....	16.50g	.....	.....	.08	.14
Seattle	.....	.....	.....	16.00A	36.50A	15.75Ar	.....	18.00A	22.00Ar	17.50Ar	.08A	.09A

‡ Delivered.
PAVING BRICK & BLOCK: a CL. b 3½ x 4 x 8½. c 2½ x 8½ x 4. d LCL, truck deliveries. e Not used. f 2" interior 6¢ treat. g 3". k 8¢ treat.
ASPHALTS: a Price at plant, Everett, Mass. b F.o.b. refinery, Lockport, Ill. c F.o.b. Sugar Creek, Mo. d F.o.b. refinery, El Segunda. e F.o.b. Baton Rouge. f F.o.b. Wood River or Roxana, Ill. g F.o.b. Richmond, Calif. h F.o.b. Martinez. i Bulk refinery. j F.o.b. refinery, Englewood, Calif. k 50–110 penetr. l Less than 100 penetr. m 40–80 penetr. n Tax incl. o Drums not avail. p Shipped in steel bbl. q Use of used drums r In customer's drums. s Shipped in drums, per drum. t 55-gal. drums. u Per 100 gal. v Per ton. w Per gal.

IRON AND STEEL PRODUCTS—PER 100 LBS. BASE MILL PRICES

	STRUCT. SHAPES—PLATE	REINF. BARS billet	RIVETS* ¾-in. structural	SHEET PILING Base	STEEL RAILS Per Net Ton Standard	Light	Re-rolled	TRACK SUPPLIES Angle Bars	Std Spikes*	Tie Plates	Track Bolts*
Birmingham Area	$3.65	$3.70	$7.25	....	$72.00	$80.00	Not	$4.70	$5.60	$4.50	....
Chicago Area	3.65	3.70	7.25	$4.20	72.00	80.00	avail-	4.70	5.60	4.50	....
Pittsburgh Area	3.65	3.70	7.25	4.20	72.00	80.00	able	4.70	5.60	4.50	....
Buffalo Area	3.70	3.70	7.25	4.20	72.00	80.00	....	4.70	5.60	4.50	$8.85
Cleveland	....	....	7.25	....	....	....	....	....	....	....	8.85
Youngstown Area	....	3.70	....	....	....	....	....	....	5.60	....	....
Geneva	3.65	....	....	....	....	....	....	....	....	....	....
Los Angeles	....	4.40	....	....	....	....	....	....	5.60	....	....
Pueblo	3.65	3.70	....	....	72.00	80.00	....	4.70	5.60	4.50	8.85

* New prices not available in time for this issue.

IRON AND STEEL PRODUCTS—F. O. B. WAREHOUSE, PER 100 LBS., BASE PRICE

	STRUCTURAL SHAPES Per 100 lb. base price	REINFORCING BARS Per 100 lb., base price *u* 5 tons to carload lot *b* New billet	Rail steel	Add switch	$/cwt for Del.	EXPANDED METAL LATH *k* Per 100 sq. yd., carload lots Std. diamond mesh, 3.4 lb.	Std. ribbed 3.4 lb.	WELDED FABRIC REINFORCING *d* Per 100 sq. ft., carload lots 4x16 in., No. 5 & 10 wires	4x12 in., No. 8 & 12 wires	6x6 in., No. 6 & 6 wires
Atlanta	$6.03	$5.85	$5.85	$.025	$ .10	$31.50	$31.50			
Baltimore	6.09	5.06*l*	....	....	.10	40.00	43.00			
Birmingham	5.25	5.25	5.25	.05	.15	42.00*p*	44.50*p*			
Boston	5.75*k*	5.61*k*	5.61*kc*	....	.10/.15	32.00	34.50			
Chicago	5.25	4.50*ff*	4.50*ff*	.0625	....	32.00‡	34.50‡			
Cincinnati	5.79*r*	5.54*r*	....	....	....	34.00*zee*	36.50-*zee*			
Cleveland	5.37	4.47*e*	....	....	.10	34.00‡	36.50‡			
Dallas	8.15	6.10	6.10	....	....	47.85	50.60			
Denver	6.65	6.75*c*	....	....	....	52.00*s*	62.00*gs*			
Detroit	5.64	5.59*n*	....	....	.10	38.00	49.00			
Kansas City	5.65*nn*	5.56*c*	....	....	....	35.50	38.00			
Los Angeles	5.90*fkk*	5.70*g*	....	....	.15	44.50*f*	49.50*kk*			
Minneapolis	5.61*kk*	6.87*ll*	6.87*ll*	....	.15	34.00	36.50			
Montreal	6.75*i*	4.75*i*	4.75*g*	....	....	44.10*h*	46.80*h*			
New Orleans	....	5.40*nk*	....	.05	.10	38.50	41.00			
New York	5.75*r*	5.69	5.54	....	.20	35.50*bt*	38.00*bt*			
Philadelphia	5.45	5.60	....	....	....	35.50‡	38.00‡			
Pittsburgh	5.20/5.30	5.20/5.30	....	....	.10	33.85	35.35			
St. Louis	5.58	4.94*c*	4.94*c*	....	....	42.00*aa*	48.00*aa*			
San Francisco	6.30*ii*	5.75*d*	....	....	.15	40.00	42.50			
Seattle	4.95*z*	5.35*ef*	....	....	....	52.00*mmm*	42.00*mmx*			

A.P.M.* Joliet, Illinois, Donora, Penn., $2.46; F.o.b. Mill: Monessen, Penn., $2.56

A.P.M.* Joliet, Illinois, Donora, Penn., $1.75; F.o.b. Mill: Monessen, Penn., $1.81

A.P.M.* Joliet, Illinois, Donora, Penn., $2.58; F.o.b. Mill: Monessen, Penn., $2.69

* At Producing Mill.

‡ Delivered. *a* 1–5 tons, add 35¢. *b* Less than 1 ton, add 50¢. *c* 20 tons or over base. *d* Mill price plus freight. *e* F.o.b. plant. *f* Includes delivery in free delivery zone. *g* 10,000 to 39,999 lbs. *h* List price. Dominion tax exempt. Provincial and Municipal tax extra. *i* Plus Dominion, Provincial and Municipal sales tax. *j* Price per ton. *k* F.o.b. city. *l* Intermediate and hard grade, new billet. *m* Per sq.yd. *n* 5–10 tons. *o* 5 to 15 tons base. *p* Del. of 5000 sq. yd. or less. *q* Std. ribbed, 4 lb. per sq. yd. *r* 5 tons or over. *s* LCL. *t* Asphalt coated. *u* Note: Revised size extra — 1 in., 1¼ in., 1½ in., 10¢; ⅞ in., ¾ in., 15¢; ⅝ in., 25¢; ½ in., 50¢; ⅜ in. 80¢. ¼ in. $1.90. *v* 20 tons. Straight. *w* Copper bearing. *x* 2.5 lb. per sq. yd. *y* $0.0093 transportation tax included. *z* Copper alloy. *aa* Delivered truck to job. Contractor to do unloading. *dd* F.o.b. dock. *ee* F.o.b. cars. *ff* Carload lots. *gg* Including sales tax. *hh* 10,000–19,999 lbs. *ii* Rolled at Geneva mill. 400–3999 lbs. *kk* ¼" ribbed. *ll* 5 to 8 tons. *mm* 2½% off for cash. *nn* 10 tons or over.

PLUMBING, HEATING, WATER, SEWER AND DRAIN PIPE

	C. I. PIPE Per net ton f.o.b. 6 in. to 24 in. *a*	VITRIFIED SEWER PIPE Per foot, Delivered ASTM C13-44T std. 8 in.	std. 12 in.	24 in.	36 in.	CLAY DRAIN TILE ASTM C4-24 Per 1,000 ft., carload lots, f.o.b. 6 in.	8 in.	CONCRETE SEWER PIPE Per ft., delivered: ASTMC 14-41 12 in.	24 in.
Atlanta	$93.00	$0.43	$0.67	$3.39	$7.00	$114.00	$140.00	$0.45	$2.00
Baltimore	97.36	.51	.9855	4.05	10.805	168.60	260.40	.85	2.35
Birmingham	86.00	.40	.72	2.84	....	210.00‡	375.00‡	.90	1.50
Boston	105.96	.504*acc*	.972*acy*	4.23*acy*	11.28*acy*	181.80*c*	280.20*c*	1.45*mg*	3.60*mg*
Chicago	99.99	.65	1.25	5.10	13.50	150.00‡	270.00‡	.80	2.80
Cincinnati	98.00	.476	.918	3.87	10.25	148.80‡	230.70‡	.70*m*	2.60*m*
Cleveland	100.63	.434*x*	.837*x*	3.51*x*	9.335*x*	147.00	229.00	.72*m*	2.75*m*
Dallas	102.78	.436	.822	3.234	9.17	....	....	.49	1.60
Denver	107.86	.43*dd*	.74*dd*	3.18*dd*	....	....	....	.74*dd*	2.50*dd*
Detroit	95.63	.66	1.30	5.10	13.90	240.00*m*	360.00*m*	.75	3.00
Kansas City	101.91	.47*m*	.84*m*	3.35	....	215.00	....	.70	3.00
Los Angeles	114.56	.503*l*	.996*l*	4.871*l*	12.145*l*	212.30	324.60	.79	2.25*ff*
Minneapolis	94.86-104.17	.66*mo*	1.20*mo*	4.85*mo*	....	....	....	1.355*h*	3.85*h*
Montreal	90.00	.77 *z*	1.35*z*	4.47*z*	7.23*ez*	....	....	72.00*khaa*	218.00*khaa*
New Orleans	96.18	.453	.82	4.41	8.85*	235.00*bb*	412.00*bb*	.65	2.29
New York	101.30-106	.68	1.17	4.69	12.42	....	....	1.00	2.50
Philadelphia	93.97	.60	1.10	4.33	12.56	270.00‡	330.00‡	1.35*h*	3.60*h*
Pittsburgh	101.26	.36*m*	.70*m*	2.70*m*	6.625*m*	147.50	230.00	1.05*h*	2.50*y*
St. Louis	97.77	.51	.93	3.65	8.50	....	....	1.10*il*	2.45*hl*
San Francisco	114.56	.55*nl*	1.08*nl*	4.68*nl*	11.70*nl*	195.00*dl*	325.00*dl*	.69	2.85
Seattle	116.45	.51*ib*	.91*ib*	....	....	150.00*e*	....	.86*ee*	2.64*ee*

*WROUGHT STEEL PIPE† (Full standard weight)

Mill	3½ to 6 in. Butt Weld† Black	Galv.	2½ & 3 in. Butt Weld† Black	Galv.	Lap Weld† Black	Galv.	Mill
	%	%	%	%	%	%	
Lorain, Ohio	43.0*a*	22.0*a*	48.0	28.5	48.0	26.5	Sharon, Pa.
Aliquippa, Pa.	40.0	20.0	48.0	26.5	48.0	27.0	Wheatland, Pa.
Sparrows Pt., Md.	....	....	48.0	....	48.0	28.5*b*	Etna, Pa.
Youngstown, O.	42.0*c*	22.0*c*	48.0	28.5	48.0	23.5*b*	Fontana, Calif.
Indiana Harbor, Ind.	42.0*a*	22.0*a*	48.0	27.5	48.0	27.0	Benwood, W. Va.
	43.0*a*	22.0*a*	48.0	26.5	48.0	27.0	Youngstown, O.
	42.0*c*	22.0*c*	48.0	28.5	48.0	28.5*b*	Wheatland, Pa.
	31.0*ab*	17.0*ab*	37.0*b*	23.5*b*	37.0*b*	23.5*b*	Fontana, Calif.

b Continuous weld. *c* 5 and 6 in. *d* 3½ to 4 in. † Threaded and coupled.

* WROUGHT STEEL PIPE: Discounts from standard list consumers carload prices. Base price approx. $200 per net ton. List prices per ft.: *Butt Weld:* ⅛ in., 5½¢; ¼ in., 6¢; ⅜ in., 6¢; ½ in., 8½¢; ¾ in., 11½¢; 1 in., 17¢; 1¼ in., 23¢; 1½ in., 27½¢; 2 in., 37¢; 2½ in., 58½¢; 3 in., 76½¢. *Lap Weld:* 3½ in., 92¢; 4 in., $1.09; 5 in., $1.48; 6 in., $1.92. Freight rates to destination to be added to price plus 3 percent tax on transportation. † New prices not available.

WROUGHT IRON PIPE: List prices per ft. same as wrought steelpipe. Discount for Pittsburgh base. *Butt Weld* — 1 in. and 1¼ in. black, + 10.5, galv. + 38.5; 1½ in. black, 4.5, galv. + 35.0; 2 in. black, 4 galv. + 34.5. *Lap Weld* — 2½ in. to 3½ in. black + 11, galv.+ 38.0; 4½ in. to 8 in. black + 8, galv.+ 33.5. Freight rates to destination to be added to name delivered price.

(Continued on page 105)

QUICKSAND SANDWICH IN RICE STADIUM DEWATERED BY *MORETRENCH*

Excavating a foundation 24 feet deep with clay on top — clay at grade — and ten feet of quicksand sandwiched in between — presented a major problem in the construction of Houston's $2,000,000 Rice Institute Stadium.

Brown and Root, Inc., contractors for this project, knew how to solve it in a hurry. A Moretrench Wellpoint System took the water (and the trouble) out of the quicksand, enabling them to put in a clay corewall 15 feet deep which sealed off the water from the outside. Excavation then proceeded rapidly — in the dry.

When you want action — and results — on a pumping problem, follow the lead of America's foremost contractors — get in touch with MORETRENCH!

MORETRENCH CORPORATION

90 West St. | 4900 S. Austin Ave. | 7701 Interbay Blvd. | 315 W. 25th St. | Rockaway

Now!

New principle for backhoes provides

UNBELIEVABLE DIGGING POWER

It's in the New Sherman Power Digger!

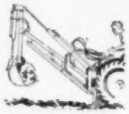
- Patented, actuated bucket gives you selective digging action, better loading, greater versatility.
- All-hydraulic action—made possible by heavy-duty hydraulic cylinders—assures efficient performance.

Specifications

Shovel reach below ground surface	8 feet
Digger reach behind tractor	10 feet
Swinging arc	140°
Trench width, standard digging shovel, single cut	18 inches
Digging shovel capacity	3.5 cu. feet
Loading shovel capacity	.5 cu. feet
Loading clearance, digging shovel, loaded	7 feet
Loading clearance, loading shovel	10 feet

- *Standard tractor mounting gives unmatched maneuverability and transportability.*

- *Digs ditches, trenches, footings, culverts, basements and other excavations.*



- *Handles roots, rocks, hard clay and oiled road surfaces.*

- *Works well behind the tractor at any angle.*

- *Actuated bucket raises high enough to load standard dump truck.*

Find out about this addition to the Sherman line of digging equipment. It is an economical answer to your digging problems. Write for literature today!

SHERMAN POWER DIGGER

Designed, Engineered and Manufactured Jointly By
SHERMAN PRODUCTS, INC. • Royal Oak, Michigan
WAIN-ROY CORP. • Hubbardston, Massachusetts

Sold Exclusively By
SHERMAN PRODUCTS, INC.

PATENT NO. 2,303,832 OTHER PATENTS PENDING

SHERMAN PRODUCTS, INC. • ROYAL OAK, MICHIGAN

LUMBER, TIMBER, PLYWOOD—PER M FT., B.M., CARLOAD LOTS F. O. B.

SHORT LEAF YELLOW PINE AND DOUGLAS FIR

All S. L. Y. P. is No. 2 common or better and for No. 1 N. C. Box. (Prices in Bold Face)
All Fir boards, dimensions, planks No. 2, Fir small timbers and timbers are No. 1. Lengths up to 20 ft.
(*Prices in italics*)

	1x6 s4s	1x8 s4s	2x4 s4s	2x6 s4s	2x8 s4s	2x10 s4s	3x12 Rgh	6x12 Rgh	12x12 Rgh
Atlanta	† **$75.00**	**$78.00**	**$67.50**	**$69.50**	**$74.00**	**$78.00**	**$77.50**		
Baltimore	* **80.00**	**85.00**	**85.00**	**85.00**	**85.00**	**90.00**	**100.00**		
	104.00g	*104.00g*	*86.50g*	*86.50g*	*86.50g*	*84.50g*	*98.75*	*$103.50*	*$103.50*
Birmingham	† **83.00**	**85.00**	**65.00**	**80.00**	**85.00**	**85.00**	**85.00**		
	80.00	*80.00*	*78.00*	*77.50*	*77.50*	*80.00*	*81.00*	*81.00*	*81.00*
Boston	* **95.00a**	**98.00a**	**85.00a**	**92.00a**	**94.00a**	**96.00a**			
	90.00	*95.00*	*100.00*	*100.00*	*100.00*	*100.00*	*114.00*	*114.00*	*114.00*
Chicago	**98.00	**100.00**	**90.92**	**95.96**	**97.98**	**105.00**	**102.00**		
	98.00	*98.00*	*98.102*	*98.102*	*98.102*	*100.00*	*100.00*	*115.00*	*115.00*
Cincinnati	* **110.00**	**113.00**	**95.102.50**	**100.00**	**108.00**	**115.00**	**115.00**		
	108.00	*108.00*	*108.00*	*108.00*	*108.00*	*108.00*	*108.00*	*170.00*	*170.00*
Cleveland	** **95.00**	**97.00**	**87.50**	**93.00**	**95.00**	**98.00**			
	107.00	*107.00*	*107.00*	*107.00*	*107.00*	*107.00*	*107.00*	*107.00*	*107.00*
Dallas	k† **78.00**	**80.00**	**69.00**	**58.00**	**59.00**	**59.00**	**98.00**		
Denver	* *Not in stock*		*106.00*	*106.00*	*106.00*	*106.00*	*138.00*	*143.00*	*141.00*
Detroit	‡ **100.00**	**100.00**	**90.00**	**100.00**	**103.00**	**105.00**			
	98.00	*99.00*	*100.50*	*100.50*	*99.50*	*98.25*	*102.25*	*105.00*	*105.00*
Kansas City	* **110/120**	**115.00**	**120.00**	**120.00**	**120.00**	**120.00**			
	110/120	*119.00*	*120.00*	*120.00*	*120.00*	*120.00*	*135.00*	*145.00*	*145.00*
Los Angeles	1 *90.00*	*90.00*	*88.00*	*88.00*	*88.00*	*88.00*	*105.00*	*115.00*	*105.00*
Minneapolis	f *185.00*	*185.00*	*135.00*	*135.00*	*140.00*	*140.00*	*150.00*	*150.00*	*150.00*
Montreal	ab *75.00*	*79.00*	*75.00*	*77.00*	**80.00**	**80.00**			
	160.00	*160.00*	*160.00*	*160.00*	*160.00*	*165.00*		*165.00*	
New Orleans	† **80.00**	**83.00**	**75.00**	**80.00**	**83.00**	**85.00**	**100.00**		
	† *76.00*	*78.00*	*80.00*	*80.00*	*82.00*	*77.80*	*77.00*	*76.00*	*70.00*
New York	3 **105/110**	**109/114**	**100/110**	**110/120**	**115/125**	**120/130**	**145/160**		
			Range from $110.00 to $120.00				*120/130*	*130/140*	*130/140*
New York	** **92.00**	**96.00**	**80.00**	**94.00**	**95.00**	**96.00**	**115.00**		
	100.00	*100.00*	*105.00*	*105.00*	*105.00*	*105.00*	*118.00*	*120.00*	*120.00*
Philadelphia			**Range from $117.00 to $127.00**				**117/127**		
			Range from $130.00 to $140.00				*130/140*	*140/150*	*140/150*
Pittsburgh	†		**Range from $80.00 to $90.00**			**90/100**	**90/105**		
			Range from $95.00 to $100.00			*95/105*	*110/120*	*95/105*	*110/120*
St. Louis	fc **115.00**	**117.25**	**104.25**i	**109.75**i	**118.50**e	**126.75**d			
			126.00e	*125.50e*	*125.50e*	*126.25e*	*143.50e*		*153.00*
San Francisco	A† *85/85*	*85/85*	*89.95*	*89.95*	*89.00*	*89.00*	*85/85*	*85/85*	*85/85*
Seattle	† *82.50g*	*82.50g*	*82.50g*	*82.50g*	*82.50g*	*82.50g*	*82.50g*	*82.50g*	*82.50g*

	LONG LEAF Y. P. Merchantable grade up to 20 ft.		PLYWOOD Rail freight increment (See note for base price)	
	2x12 Rgh	12x12 Rgh	⅜"	¾"
Atlanta			$22.32	$27.24
Baltimore	**$145.00**	**$148.00**	22.86	27.90
Birmingham	**115.00**	**125.00**	21.78	26.58
Boston	**128.00**	**128.00**	22.86	27.90
Chicago	**125/130**	**125/130**	18.72	22.80
Cincinnati			21.78	26.58
Cleveland			22.20	27.12
Dallas	**104.00**	**98.00**	18.72	22.80
Denver			13.92	16.98
Detroit			21.78	26.58
Kansas City			16.56	20.16
Los Angeles			13.38ab	16.26ab
Minneapolis			16.56	20.16
Montreal	**135.00**	**135.00**	18.72	22.80
New Orleans	**210/240**f	**210/240**f	22.86	27.90
New York			22.86	27.90
New York	**190/200**	**190/200**	22.86	27.90
Philadelphia	**95/100**	**110/120**	22.56	27.48
Pittsburgh			18.72	22.80
St. Louis			10.08a	12.30a

† F.o.b. mill. * F.o.b. city, CL, out of yard. ** F.o.b. city, CL, direct mill shipment. ‡ Deliv. to contr. CL. 1. Retail, LCL, at yard. f Retail, LCL, deliv. 2. Deliv. truck lots. 3. asd.

LUMBER: **Bold Face type, Southern Pine.** *Italics, Douglas Fir.* a Spruce b Tax exempt. c 5M lots. d 8–12 ft. lengths. e 8–16 ft. lengths. f 18 ft. or under. g No. 1 common. i 8 ft. lengths. k No. 3 common

A Rail freight rate from Northwest mills to San Francisco are $11.50 to $15.00 per M ft bm. From Northern Calif. mills $9.00 by rail $12.00 by truck to yard with surfaced stock $2.00 to $3.00 less.

PLYWOOD: Special concrete form grade Fir Plywood, 4' by 8' panels, 5-ply, sanded 2 sides, water resistant glue, carload lots, delivered per 1,000 sq. ft. surface. Seattle base price on ½", $200.00; on ¾", $225.00. For other centers add rail freight increment from table on proper size. Oiling and edge sealing charges included. a Lower rate by water shipment. b 50,000 lb. minimum.

* Freight rate increase of 6¢ per cwt., not included in these figures.

GLASS, EXPLOSIVES, CHEMICALS

WINDOW GLASS

Discounts from jobbers list, Feb. 1, 1950a

	Single or Double Thickness A quality	Single or Double Thickness B quality
Atlanta	76%c	76%c
Baltimore	80–10%	82–10%
Birmingham	83%	83%
Boston	79–10%	79–10%
Chicago	78%f	78%f
Cincinnati	78%	78%
Cleveland	80–10–10%f	80–10–10–10%f
Dallas	75%	75%
Denver	81–5%	81–5%
Detroit	78–10–10%	78–10–10%
Kansas City	80–10–10%	80–10–10%
Los Angeles	75%	80%
Minneapolis	78–10%	78–10%
Montreal	40–5%bc	40–10–5%bc
New Orleans	83%	83%
New York	83%f	83%f
Philadelphia	80%	82%
Pittsburgh	82%	82%
St. Louis	70–10%e	70–10%e
San Francisco	66%e	73%e
Seattle	52%e	53%e

EXPLOSIVES

	Per lb. 40% Ammonia Gelatin in 50 lb. cases delivered in 200 lb. lots*
	$0.2175
	.2175
	.1650
	.2175
	.2175
	.2175
	.2575
	.2250
	.2225
	.2175
	.2225
	.22
	.2225
	19.15h
	.2225
	.37g
	.2175
	.19
	.2225
	.2175
	.22

Price of 60% Ammonia Gelatin is $0.0125 per lb. higher than 40%

Glass: a Jobbers' list price per box, 14 x 20, ss, $42.75 for A quality, $37.50 for B quality; 14 x 20, ds, $60.00 for A quality, $52.75 for B quality. b Discount from list, Sept. 1939; sales tax included, but 6% tax exemption not allowable for. c Single thickness. e Discount from list of Jan. 16, 1946. f Disc from Oct. 1950.

Explosives: * Urban prices influenced by service charges or local storage and delivery regulations do not consistently reflect quantity prices in less congested areas. g In borough of Kings, Queens, and Richmond and in Manhattan south of Canal St., add delivery charge of $9.00 per trip. h F.o.b. city per 100 lb. forcite, 40%. Forcite 60%, $20.90. i F.o.b. Beloeil (near Montreal).

40% Ammonia Gelatin price ranges in other than urban areas, per lb. (except Seismograph Grades)

C.L. 20,000 lb. net

	Tons	200 lb. lots
E. of the Miss., except Fla. and Me.	$0.165	$0.1975	$0.2175
W. of Miss. to Rocky Mtn. States, Fla. and Maine	.17 –.1775	.2025–.21	.2225–.23
Rocky Mtn. States	.17 –.1825	.2025–.21	.2225–.235
Pacific N. W. States	.1675–.18	.20 –.2125	.22 –.2325
Pacific S. W. States	.165 –.1725	.1975–.20	.2175–.2225

PILES, TIES F. O. B.

PILES

Prices per linear foot, fir and pine, bark off, f.o.b. cars, New York. Fir based on Wash. and Ore. points to New York shipping area; pine based on freight from Norfolk.

Dimensions	Points	Length	By Rail Pine*	By Rail Fir
12-in. at butt	6-in.	30 to 50-ft.	$0.43	....
12-in.—2-ft. from butt	6-in.	50 to 59-ft.	.46	....
12-in.—2-ft. from butt	6-in.	60 to 69-ft.	.50	....
12-in.—2-ft. from butt	6-in.	90 to 100-ft.	....	.79
13-in.—3-ft. from butt	5-in.	91 to 100-ft.	....	.80
14-in.—2-ft. from butt	6-in.	50 to 69-ft.	.50	.87
14-in.—2-ft. from butt	6-in.	70 to 79-ft.	.54	.81
14-in.—2-ft. from butt	5-in.	80 to 85-ft.	.67	.82
14-in.—2-ft. from butt	5-in.	85 to 89-ft.	....	.83
14-in.—2-ft. from butt	5-in.	90 to 100-ft.	....	.87

* Pine piling over 80-ft. available only in limited quantities.

RAILWAY TIES

Prices f.o.b. per tie for carload lots:		6"x8"x8' Untr.	6"x8"x8' Tr.	7"x9"x8'6" Untr.	7"x9"x8'6" Tr.
Boston	Oak	i			
	Pine	i			
New York	S. L. Sap Pine	$1.65	$3.00	$2.25	$3.40
	Mixed Oak	2.00	3.20	2.50	3.70
Birmingham	Hardwood	2.00	3.13a	2.68	4.16a
Chicago	Red Oak	....	3.70/3.75a	....	4.75/4.80a
Los Angeles	Douglas Fir	....	....	....	....
	Redwood	....	....	....	....
Philadelphia	Red Oak	2.15/2.33	3.10/3.13a	3.00/3.10	4.15/4.25a
St. Louis	White Oak	2.70	....	3.45	....
	Red Oak	2.65	3.35a	3.40	4.30a
	Sap Pine or Cypress	3.20a	....	4.05	....
San Francisco	Douglas Fir	1.92e	2.88ef	2.52ef	3.78eef
Montreal	Birch or Maple	h	h	h	h

Tr.—Treated; Untr.—Untreated. a Creosoted. b 7" x 9" x 8'. c Empty cell. e Green. f F.o.b. cars. h No constant price available. i Not available.

CHEMICALS

Water, sewage treatment, road work, f.o.b. carlots, New York

Bleaching powder in drums f.o.b. works, per 100 lb	$5.00
Chlorine cylinders, liquid, per lb. f.o.b. works	.0875
Calcium chloride, 77–80%, flaked, 100-lb. paper bag, f.o.b. works, ton	25.00
Silicate of soda, 52 deg., in drums, f.o.b. works, per 100 lb	2.00
Soda ash, 58%, in paper bags, per 100 lb. dense	1.60
Sulphate of aluminum, commercial, in 100-lb. bags f.o.b. works	1.65
Sulphate of copper, in bags, 99% per 100 lb. f.o.b. works	8.95

STRUCTURAL CLAY BUILDING TILE, BRICK AND LIME—DELIVERED

	STRUCTURAL CLAY TILE PARTITION — SCORED Per M. lots of 2,000 pieces or over, 3x12x12 in.	4x12x12 in.	8x12x12 in.	STRUCTURAL CLAY TILE — LOAD BEARING — SCORED Per M. lots of 2,000 pieces or over, 8x12x12 in.	10x12x12 in.	12x12x12 in.	BRICK Per M. in quantity Common backing	Straight hard	LIME Per ton, In paper, Carload lot, Hydrated finishing	Common hydrated	Pulverized, or lump
Atlanta	.....	.....	.....	.....	.....	.....	$26.75	$26.75	$19.00	$17.50	$17.50
Baltimore	$175.00	$185.00	$325.00	$380.00	.....	.....	36.00*d*	41.00*k*	26.00	20.00	.....
Birmingham	97.50	104.00	195.00	231.00	.....	.....	20.00*ff*	22.50*gg*	24.74	16.30	.....
Boston	149.00†	161.50†	298.00†	338.00†	.....	.....	33.50*h*	36.50*h*	32.30†	27.90†	.....
Chicago	135.00	145.00	280.00	.....	.....	.....	21.00	23.00	30.80	24.50	.....
Cincinnati	170.00*j*	180.00*j*	330.00*jdd*	278.00*j*	$355.00	$405.00	38.50*j*	48.25*j*	26.00*j*	24.25*j*	24.25
Cleveland	118.00*cc*	126.00*cc*	236.00*cc*	.....	.....	.....	30.00	30.00	25.50	23.50	29.90*ee*
Dallas	.....	110.00	.....	.....	.....	.....	18.75	33.25	31.90	21.80	.....
Denver	.....	.....	.....	.....	.....	.....	34.00	40.00	34.80*bb*	28.00*bb*	34.00*bb*
Detroit	117.08	124.88	234.15	.....	290.68	332.20	33.50*cc*	32.00*cc*	30.00	30.00	.....
Kansas City	115.50	122.50	245.00	245.00	303.50	367.00	26.00*o*	39.50*o*	28.50*p*	22.50*p*	25.00*p*
Los Angeles	*r*	*r*	*r*	*r*	*r*	*r*	20.00§	.....	36.00	36.00	32.00
Minneapolis	165.00*p*	185.00*p*	373.00*p*	185.00*ep*	.....	.....	32.00*ep*	36.00	37.00*bbe*	26.00*bbe*	38.00*bbde*
Montreal	143.00*aq*	157.00*au*	292.00*au*	.....	.....	.....	26.50	36.50	30.00*u*	.....	.....
New Orleans	160.00	160.00	300.00	.....	.....	.....	29.00	.....	38.00	26.00	37.50
New York	121.60*h*	129.70*h*	178.30*ch*	194.60*hn*	.....	.....	35.00	.....	36.00	28.00	.....
Philadelphia	126.30	134.80	252.60	302.74	361.35	455.74	29.00	32.00	33.00	21.50	26.50
Pittsburgh	112.00	117.00	189.00	216.00	279.00	317.00	32.00	37.00*gg*	24.00	22.00	2.97*m*
St. Louis	120.00	135.00	180.00	252.00	339.00	.....	37.00*ll*	34.00*ll*	.85*aaa*	.60/.65*aaa*	1.00*aapee*
San Francisco	132.00*x*	148.50*x*	198.00*bbla*	148.50*bx*	.....	.....	33.00	.....	25.30	25.30	2.49*m*
Seattle	150.00*ee*	160.00*ee*	.....	160.00*eeve*	.....	.....	32.00*u*	40.00*u*	37.50*ahh*	1.50*ii*	3.90*mhh*

† F.o.b. yard Roxbury. *a* Smooth. *b* Per 50 lb. bags. *c* 6 x 12 12 in.-3 cell. *d* Pulverized hot. *e* 5% 10th following month. *g* 5½ x 8 x 12. *h* F.o.b. trucks, job site N.Y.C. *i* F.o.b. warehouse only. *j* Truck load or over. *k* $1.00 discount. *l* Red face. *m* Per bbl., 180 lb. *n* 7½ x 7½ x 12. Speed title. *o* F.o.b. Buffalo. *p* Truck lots. *q* Provincial and Municipal tax extra. *r* Not used because of earthquake danger. *s* 2% discount for cash. *t* 5½ x 8 x 11½. *u* Tax exempt. *v* Sand lime. *w* 5 x 8 x 12. *y* Stacked. *z* Pebble lime price per 80 lb. sack. *aa* Price per sack. Lime not sold per ton. *bb* LCL. *cc* Truck delivery. *dd* 6 x 12 x 12. *ee* Pebble lime. *ff* 80% common. *gg* Select. *hh* LCL. § F.o.b. plant. *ii* Per 50 lb sack, no incr., ton price no longer quoted.

PAINT, ROOFING—F.O.B. CARLOAD LOTS

	RED LEAD Per 100 lb. in 600-lb. (Approx.) bbl. Dry *a*	WHITE LEAD Per 100 lb. in 100 lb. cases in oil *w*	READY-MIXED PAINT Per gal., drums Graphite *b*	Aluminum *c*	Ferric Oxide *d*	ROOFING SUPPLIES Carload lots f.o.b. factory Rolls, slate surfaced, 85-90 lb. per sq.	Asphalt felt, per 100 lb.	Tar felt, per 100 lb.	Asphalt coating per gal.	Tar pitch 360 lb. bbl. per ton
Atlanta	$20.00	$29.725	$1.75	$2.70	$1.65	$2.06‡	$2.06‡	$2.06‡	$1.00‡	$36.00‡
Baltimore	19.75	29.35	2.55	4.10	3.10	2.90	4.17	4.17	.42	37.00
Birmingham	20.00	29.725	3.90	3.40	....	2.80	2.75	2.75	....	40.50*ee*
Boston	19.75	29.35	....	....	....	2.86*q*	2.79*o*	2.79*o*	.42	42.00
Chicago	19.75	29.35	....	....	....	2.73‡*u*	2.79‡*o*	2.79‡*o*	38.00‡*bbr*	40.00‡
Cincinnati	19.75	29.35	2.90	2.90	....	3.02‡	2.98‡*o*	2.98	.57*y*‡	....
Cleveland	19.75	29.35	2.75*pgg*	2.85*pgg*	2.50	2.50	2.50*o*	2.50*o*	.30*y*	35.00
Dallas	20.00	30.10	....	4.05	....	3.50*q*	3.75*o*	4.35*o*	.36	46.00
Denver	20.25	29.85	2.82	4.50	2.63	3.20*o*	2.57*o*	2.57*o*	.41*ff*	40.00
Detroit	19.75	29.35	2.35	3.30	2.50	2.35	2.50*ff*	2.50	.51	38.00
Kansas City	19.75	29.47	....	2.46	2.50	2.24	3.33	3.33	.301	44.20
Los Angeles	19.75	29.60	3.05	4.00	3.75	2.48	1.68*ee*	*l*	.37	*l*
Minneapolis	19.75	28.55/29.47	....	....	....	2.50*ddd*	2.50‡*ddd*	2.50‡*ddd*	.34*ddd*	37.00*r*
Montreal	....	29.70	3.75*t*	4.20*t*	4.62*t*	3.50*t*	3.25*tf*	3.25*tf*	1.01*t*	2.90*dtt*
New York	19.75	29.35	3.45*y*	....	....	2.50	2.50*o*	2.50*o*	.34*z*	37.00
Philadelphia	19.75	29.35	3.25	3.65	3.15	2.54	2.94	2.94	.37	26.00
Pittsburgh	19.75	29.35	2.25	2.35	2.00	2.90	2.90*o*	2.90*o*	.39	41.00
St. Louis	19.75	29.35	....	....	....	2.50	2.50*h*	2.50*h*	.36	38.00
San Francisco	19.75	29.60	1.80	2.75*n*	1.35	2.27	3.30*xa*	....	.38	....
Seattle	19.75	29.85	2.51*m*	2.67*m*	....	3.26*mqcc*	2.78*hmcc*	....	.50*mcc*	48.75*jmc*

‡ Delivered. Note: Red lead in oil 50c higher than white lead in oil. *a* Red lead prices change frequently due to pig lead price changes. *b* U. S. War Dept. Spec. 3-49A. *c* ASTM Spec. D266-31. *d* 80% minimum ferric oxide. *e* 15 lb. *f* Per 432 sq. ft. *h* Per roll, 65 lb. *i* Net carload lot prices; Minneapolis and vicinity. *j* Asphalt pitch. *k* Per cwt. *l* Not used. *m* 1% discount for cash. *n* May, 1941 price. *o* Per 60-lb. *p* 6-drum. *q* Per 90-lb. roll. *r* F.o.b. factory Chicago. *s* ASTM Spec. D266-41. *t* Federal tax included. *u* Per 90 lb. square. *v* Per ton. *w* Price to large paint contractors is $1.25 less. *y* Mineral surfaced. *y* 55-gallon container. *z* Drums *aa* Approximate cost per 100 lbs. *bb* Roofers coating and cement. Price per ton. *cc* LCL, truck delivery. *dd* 2% cash discount. *ee* Asphalt, in 100 lb. package. *ff* 5-gal. drums. *gg* F.o.b. factory.

SKILLED AND COMMON WAGE RATES—PER HOUR

	Bricklayers	Carpenters	Struct. Iron Workers	Hoisting Engineers	Plasterers	Electrical Workers	Steamfitters	Common Labor Building	Common Labor Heavy Const.
Atlanta	$2.80	$2.00	$2.25	$2.25	$2.375	$3.375	$2.35	$1.00	$1.05
Baltimore	3.00	2.35	2.65	2.80/2.90	2.50	2.50	2.50	1.35	1.35
Birmingham	2.75	2.035	2.30	1.975	2.30	2.375	2.45	1.10	1.20
Boston	2.775	2.375	2.70	2.60	2.85	2.60	2.45	1.75	1.75
Chicago	2.625*k*	2.55	2.60	2.50	2.81*n*	2.71*n*	2.60	1.90*m*	1.90*m*
Cincinnati	2.70	2.75	2.45	1.675/2.675	2.50	2.55	2.55	1.65	1.65
Cleveland	2.70	2.70*t*	2.70	2.70	2.70	2.70	2.70	1.975	1.85
Dallas	2.50†	2.125	2.25	2.25	2.50†	2.375	2.375	1.075	1.275/1.50
Denver	3.00	2.35	2.20	2.35	3.00	2.50	2.40	1.50	1.50
Detroit	2.85	2.60	2.80	2.80	2.96*il*	2.85	2.70	1.90	1.90
Kansas City	2.675	2.225	2.375	1.725/2.475	2.825	2.50	2.625	1.65	1.65
Los Angeles	2.75*w*	2.20*h*	2.50*w*	2.15*w*	3.125*w*	2.50*w*	2.50*w*	1.65	1.65
Minneapolis	2.40	2.12	2.275	2.07	2.50	2.41*n*	2.435	1.52	1.52
New Orleans	2.60	1.975	2.35	2.225	2.275	2.40	2.35	1.10	1.10
New York	3.548*r*	3.096*o*	3.348*o*	3.348*o*	3.509*ar*	3.18*as*	3.286*pf*	1.90	1.90
Philadelphia	3.31*i*	2.525	2.80*j*	2.50	3.075*k*	3.03/3.283*n*	2.825*k*	1.475	1.775
Pittsburgh	3.00	2.65	2.625	2.80	2.625	2.625	2.80	1.60	1.60
St. Louis	3.09*e*	2.50*h*	2.50	2.55	2.75	2.675*e*	2.625	1.65	1.90/1.75
San Francisco	3.00*q*	2.375	2.50	2.19	3.00	2.625	2.50	1.55	1.55
Seattle	3.00	2.195	2.395	2.33	3.00	2.50	2.50	1.795	1.83
Montreal*	1.60	1.40	1.50	1.30	1.60	1.50	1.55	1.00	.85

a 6 hr. day. *b* 7 hr. day. *c* Incl. 3% vacation stamp fund for bricklayers; 2% for electricians. * Cost of living bonus now included in basic wage. *e* Includes 5¢ per hr. tool replacement. † Plus $5.00 daily bonus. *h* $2.20 homes and housing + 5¢ vacation fund. *i* Incl. 2% welfare. *j* Incl. 9¢/hr. welfare. *k* Incl. 7½ ¢/hr. welfare fund. *l* Incl. 4% vacation fund. *m* Incl. 5¢/hr. welfare ins. fund. *n* Incl. 6¢/hr. welfare fund. *o* Incl. 3% welfare fund. *p* Incl. 3% welfare fund and 3% pension fund. *r* Incl. 3% welfare fund and 20¢ pension fund. *s* Incl. 3% welfare fund and 3% vacation fund. *t* Incl. 3% pension fund. *u* Incl. 1% welfare fund. *v* Incr. to 2.35 Dec. 11 *w* 10¢ incr. 12/11.

MEXICO CITY PRICES

In Pesos, F.a.b. City		Sept. '50	Oct. '50
Common Wages—Building (8 hr. day)	av. per hr.	.83*	.83*
Common Wages—Heavy Const. (8 hr. day)	av. per hr.	.69*	.69*
Skilled Labor Wages			
Carpenters (8 hr. day)	av. per hr.	1.88	1.88
Bricklayers (8 hr. day)	av. per hr.	1.50	1.50
Struct. Iron Workers (8 hr. day)	av. per hr.	1.50	1.50
Struct. Steel Shapes			
3"-15" x 12 meters	per ton	1,008.30	1,008.30
Reinf. Steel, Corr. Rods			
⅜" x 11 meters	per ton	1,148.30	1,148.30
½" x 11 meters	per ton	1,138.30	1,138.30
⅝" x 11 meters	per ton	1,128.30	1,128.30
¾" x 11 meters	per ton	1,108.30	1,108.30
⅞" x 11 meters	per ton	1,118.30	1,118.30
1" x 11 meters	per ton	1,118.30	1,118.30
Gravel truck load of 3½ cu. meters			
Blue Gravel	per tr. load	36.00	36.00
Rose Gravel	per tr. load	34.00	34.00
Cement, Std. Port. (Tolteca)	per ton	125.00	125.00
Lumber			
Mex. Sacred Fir (Oyamel)	per M ft.	750.00	750.00
1st Class Pine	per M ft.	1000.00	1000.00
2nd Class Pine	per M ft.	900.00	900.00

* Paid 7 days, worked 6.

ENR Skilled Average: (Bricklayers, Carpenters, Ironworkers) $2.577. **ENR Common Average:** $1.574.

Save Time with the DIRECT POUR!

FIGURING on pouring bridge piers, abutment, walls or retaining walls? No matter what it is the MultiFoote with HighLift Boom can save you money with the Direct Pour.

The MultiFoote can handle a wall form with almost the snap and click of a road pouring job. It brings you the capacity and output of a paver and it is the only paver that can put this output up 23 ft. or above. It gives you better control of the mix, saves the time always wasted in transferring the mix from one machine to another and frees the crane for other work. Your MultiFoote on wall pouring will eliminate false work and save time and money.

If you have a pouring job to do, check into the MultiFoote and the HighLift Boom. Let us tell you what others are doing with it. There is a Multifoote Sales Representative near you.

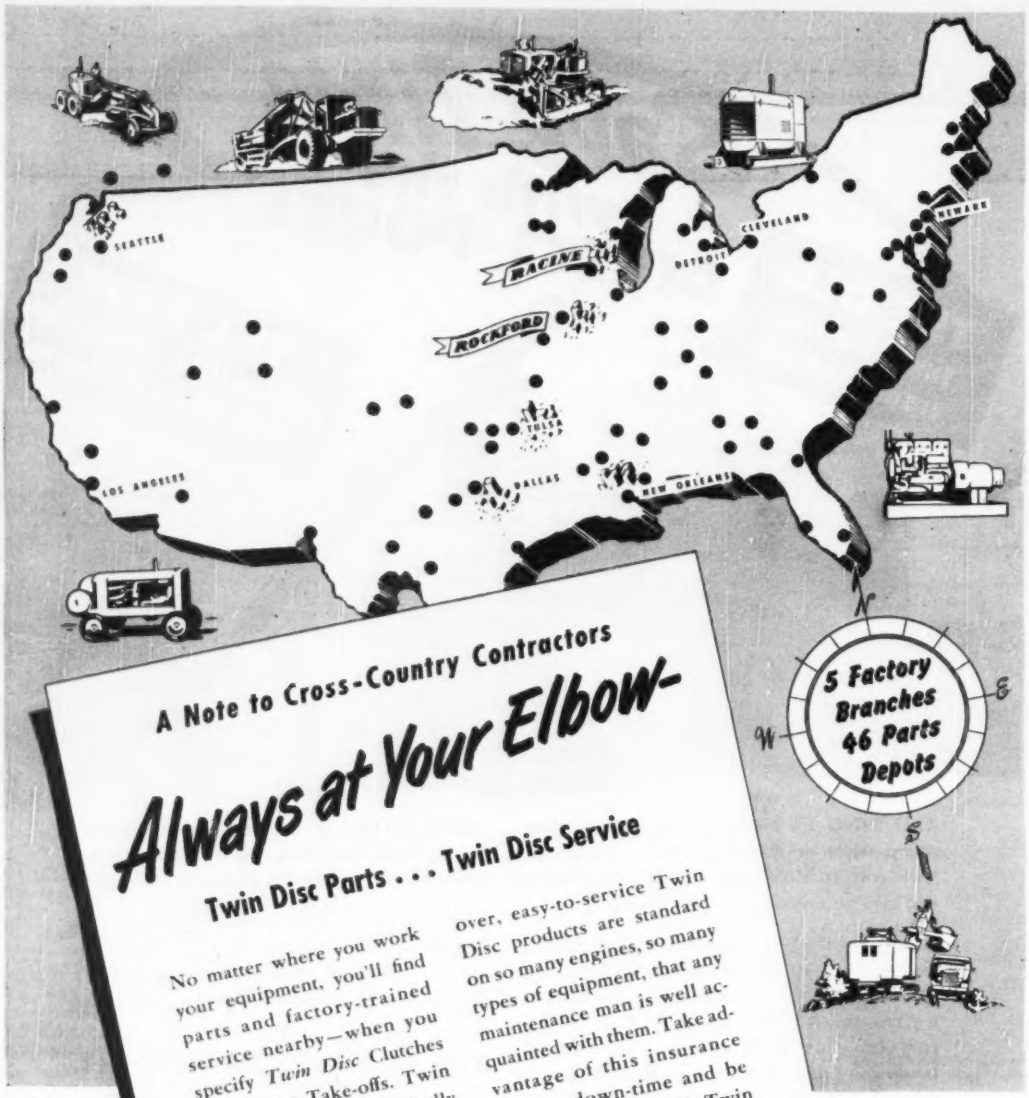
THE FOOTE COMPANY, INC.
Subsidiary of Blaw-Knox Co.
1922 State Street • Nunda, New York

MULTIFOOTE PAVER
FOR EVERY PLACE CONCRETE MUST BE POURED

Do you lay Black Top? The Adnun is an all 'round Black Top and Material Spreader. One machine for black top, stone, slag, cinder, sand or soil cement. Does the job with less cost for subgrade preparation—Ask for details.

A product of the Foote Company, Inc., Nunda, N.Y.

ADNUN BLACK TOP PAVER



A Note to Cross-Country Contractors

Always at Your Elbow—

Twin Disc Parts . . . Twin Disc Service

No matter where you work your equipment, you'll find parts and factory-trained service nearby—when you specify *Twin Disc* Clutches and Power Take-offs. Twin Disc maintains 5 strategically located Factory Branches, plus complete parts stocks at 46 other locations. Moreover, easy-to-service Twin Disc products are standard on so many engines, so many types of equipment, that any maintenance man is well acquainted with them. Take advantage of this insurance against down-time and be sure your equipment is Twin Disc-equipped.

5 Factory Branches 46 Parts Depots

Clutches & Hydraulic Drives

TWIN DISC
CLUTCHES AND HYDRAULIC DRIVES

TWIN DISC CLUTCH COMPANY, Racine, Wisconsin • HYDRAULIC DIVISION, Rockford, Illinois

BRANCHES: CLEVELAND • DALLAS • DETROIT • LOS ANGELES • NEWARK • NEW ORLEANS • SEATTLE • TULSA

CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

ELSIE EAVES, Manager — **J. A. MAHONEY, Reports** — **M. R. ROESSLER, Statistics**

WATER SUPPLY

BIDS ASKED

Md., Hyattsville—B.A. 12/11—At office W. R. Douglas, purch. agt. Washington Suburban Sanitary Comn., Hamilton St., furnishing, del. 300 tons standardized mechanical joint fittings, accessories; Contr. 889-W. 16,000 lin. ft. 12- to 24-in. Class 150 mechanical joint c.i. pipe, cement lined, incl. gaskets, glands, bolts; Contr. 888-W, 90,000 lin. ft. 6- to 10-in. mechanical joint c.i. water pipe; adv. ENR 12/7. CD 10/10/49.

SEWERS, WASTE DISPOSAL

BIDS ASKED

Tex., Sour Lake—B.A. 12/12—City, City Hall, Contr. 4, sanitary sewer collection lines, $75,000; Contr. 5, sewage treatment plant, 40x80 ft. utility warehouse and utility shop, $100,000. Plans deposit $20. Garrett Eng. Co., 5008 Almeda Rd., Houston, engr. CD 10/16.

LOW BIDDERS

Okla., Oklahoma City—City, City Hall, Nov. 21, storm sewer Contr. 1, from Banta Constr. Co., 1646 W. Main St., Zone 2, $690,580. Est. $758,049. CD 11/15.

CONTRACTS AWARDED

▲ **Ind., Evansville**—City, City Hall, sewage disposal works and sewer lines on East Side, to Ryan Constr. Co., Court Bldg., $4,815,000. Bids 11/6. CD 11/14, under LB.

▲ **Okla., Oklahoma City**—City, City Hall, Northside Sewage Disposal plant, to Earl W. Baker & Co., Bethany, $1,440,000. Est. $1,495,000. Bids 11/14. CD 11/17, under LB.

Wis., Wauwatosa—Metropolitan Sewage Comn., Jones Island, Milwaukee, Zone 1, main sanitary sewers in N. 72, S. Clarke, N. 73, W. Center and N. 75 Sts., to F. A. Goll Co., 5230 W. State St., Milwaukee, Zone 8, $87,698. Bids 11/20. CD 10/31.

BRIDGES

LOW BIDDERS

▲ **New Jersey**—New Jersey Turnpike Auth., 65 Prospect St., Trenton, Nov. 21, Contr. 46, substructure and superstructure Overpeck Creek Causeway, constr. steel sheet piling cells and timber bulkheads on side of approach embankments, embankment constr. and other incidental work in connection with N. J. Turnpike, Bergen Co., from Union Building & Constr. Corp., 631 Main Ave., Passaic, $1,324,925. CD 11/3.

Pennsylvania—State Hy. Dpt., 506 N. Office Bldg., Harrisburg, Nov. 22, continuous deck plate girder and an I-beam bridge and 132 lin. ft. crushed aggregate base with bit. surf. 24 ft. and var.able width, 1,273 ft. L. R. 40116 (4). T. R. 115; 309. The Pierce Street Bridge over Susquehanna River between Wilkes-Barre and Kingston, Luzerne Co., from Pine Brook Iron Wks, 105 Middle St., Scranton, $417,163. CD 10/27.

CONTRACTS AWARDED

South Carolina—State Hy. Dpt., Columbia, superstructure for Blossom St. Bridge over Congaree River on U.S. Route 21, U-2570 (1), at Columbia, Lexington and Richland Counties, to McMeekin Constr. Co., Cheraw, $563,000; bridge, approaches over Little Saluda River on Route 43 and bridge over Richland Creek with detour bridge and detour road near Saluda, F-416 (1), Saluda Co., to Joseph W. Barnwell, Jr., 2206 Terrace Way, Columbia, $72,773. Bids 11/14. CD 11/3.

STREETS AND ROADS

LOW BIDDERS

Indiana—State Hy. Comn., Indianapolis, Nov. 21, c. conc. wid'n. 42 ft., 38 ft., 30 ft. and 22 ft. wide, 2.373 mi. Rd. 150, West Terre Haute, Vigo Co., from Gast Constr. Co., Warsaw, $399,786, est. $405,050; c. conc., base widn. b. conc. resurf. 24 ft. and 22 ft. wide, 4.348 mi. State Rd. 23, South Bend, St. Joseph Co., from Rieth-Riley Constr. Co., Box 477, Goshen, $308,258, est. $310,894. CD 11/8.

▲ **Pennsylvania**—State Hy. Dpt., Harrisburg, Nov. 22, c. conc. 414 ft., 22 ft. and variable in width, incl. exten. existing structure, 7 rein.-con. structures, 1 rein.con. bridge, 1 plate girder bridge, construct divided highway consisting of c. conc. pavement 22 ft. wide on each side of a concrete divisor, and construct 3 rein.-con. bridges, one I-beam bridge, 31,294 ft. L. R. 187 (66); 02134 (21) 02143 (2); 348 (5); 228 (15) T.R. 22, 80, 380, from point east of the village of Mountville to point southwest of Camp Jo-Ann, Allegheny and Westmoreland Counties from Latrobe Road Constr. Inc., P.O. Box 150, Latrobe, $1,970,463***c. conc., pavement 25 ft. and variable to 50 ft. in width incl. 2 rein.-con. structures and exten. existing rein.-con. structures, divided highway consisting of c. conc. pavement 22 ft. and 23 ft. wide on each side of a concrete divisor area 2.5 ft. wide, one I-beam bridge and one rein.-con. bridge and bit. surf. for paving railroad crossing, incl. wid'n. existing pavement with c. conc. base course variable 22.83 to 13.58 ft. in width and wid'n. existing pavement with crushed aggregate base and bit. surf. variable 13 ft. to 0 ft. in width, 20,848 ft. L. R. 40033 (5-7), between Dundee and Lee Park, Luzerne Co., from B. G. Coon Constr. Co., 278 Union St., Luzerne, $845,315***crushed aggregate base with bit. surf. 22 ft. and variable in width, one rein.-con. bridge, incl. bit. surf. existing pavement variable 28 to 34 ft. wide, build-up and wid'n. existing pavement with crushed aggregate base and bit. surf. 22 ft. wide, L. R. 40031 (5), 13,449 ft. from point 3.5 mi. Mocanaqua to point 1.7 mi. from Wanamie, Luzerne Co., from Rosser Constr. Co., P.O. Box 72, Mount Joy, $273,741. CD 10/27.

CONTRACTS AWARDED

Colorado—State Hy. Dpt., Denver, grading, structures 4.062 mi. at intersection of W. 6 Ave., Denver and State Hy. 2 and exten. northwesterly to mouth of Clear Creek Canyon, Jefferson Co., to Brown Constr. Co., 1530 E. Abriendo Ave., Pueblo, $542,799. Est. $552,819. Bids 10/24, awarded 11/6. CD 10/30, under LB.

▲ **Colorado**—State Hy. Dpt., Denver, grading, ballast and minor structures 10.719 mi. located on Denver Boulder Turnpike beginning at 28 Sts. and Baseline Rd. southeast of Boulder and exten. southeasterly to Broomfield, Boulder and Jefferson Counties, to Peter Kiewit & Sons, 1950 S. University St., Denver, $1,066,766. Bids 9/26, awarded 10/6. CD 10/3, under LB.

Pennsylvania—State Hy. Dpt., Harrisburg, crushed aggregate base with bit. surf. 717 mi., 20 ft., 22 ft. and variable in width, 3 rein.-con. structures, one over tributary to Chillisquaque Creek, one over Beaver Run and other over tributary to Beaver Run, 34 ft. T-beam bridge over tributary to Beaver Run and a rein.-con. bridge over Chillisquaque Creek, portion of work will be on relocation to eliminate a grade crossing at Reading Co. R. R. near Moorsburg, T. R. 45, West Chillisquaque, East Chillisquaque and Liberty Twps., Northumberland and Montour Counties, to Middle Creek Const. Co., Middleburg, $594,904. Bids 11/10. CD 11/14, under LB.

EARTHWORK, WATERWAYS

BIDS ASKED

† **Wyoming**—B.A. 12/14—Bureau Reclamation, Dpt. Interior, Moorcroft, clearing part of Keyhole reservoir site, Missouri River Basin Proj. Spec. 602C-6. L. N. McClellian, Bldg. 1-A, Denver Federal Center, Denver, Colo., ch. engr. CD 12/14/49.

† **Michigan**—B.A. 12/15—U.S. Eng., 2015 Cadillac Tower, Detroit, install guides for stop log reaction framing, Davis and Sabin Locks, St. Mary's Falls Canal, Sault Ste Marie, CIVENG 20-064-51 (41).

LOW BIDDERS

▲† **Colorado**—Bureau Reclamation, Dpt. Interior, Loveland, Nov. 16, Bald Mountain pressure tunnel and access roads, Estes Park-Foothills Power aqueduct, Colorado-Big Thompson Proj. Spec. DC-3208, from Winston Bros. Co., Monrovia, $1,691,262, Est. $1,-876,296. CD 10/10.

▲† **Illinois**—U.S. Eng., 808 U.S. Court House & Custom House, 114 Market St., St. Louis 1, Mo., Nov. 21, bank protection for Chain of Rocks Canal, Mississippi River, Granite City and vicinity, Madison Co., divided into 2 sections Proj. Item No. 1, protection east side of canal and Proj. Item 11 on West side of canal, Inv. No. CIVENG-23-065-51-23, from Massman Constr. Co. and Kansas City Bridge Co., 20 W. 9 St., Kansas City, Mo., $1,469,200. Est. $1,624,903. CD 10/30.

CONTRACTS AWARDED

† **Oregon**—U.S. Eng., 628 Pittock Block, Portland, diversion tunnel and relocation railroad, Big Cliff Dam North Santiam River, CIVENG 35-026-51-73, to The Shea Co., 2801 W. Mission Rd., Alhambra, Calif., $324,177. Bids 11/17. CD 11/8.

Que., St. Joseph D'Alma—Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., retaining wall along Petite Decharge south bank, day labor, $200,000. R. Blais, c/o owner, engr.

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $34,000; other public works $60,000; industrial buildings $82,000; other buildings $100,000.

Classes of Construction

(Name in order of Listing)

Water Supply	Latin America
Sewers, Waste Disposal	Public Buildings
Bridges	Commercial Buildings
Streets & Roads	Industrial Buildings
Earthwork, Waterways	Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over.
B.A.	Bids Asked
ENR	Engineering News-Record
CD	Engineering News-Record Construction Daily

AIRPORTS

BIDS ASKED

N. M., Hobbs—AIRPORT—B.A. 12/18—Lea Co., Lovington, municipal airport imprvs. $90,000. Plans deposit $25. Vorhees & Standhardt, Roswell, archts.

N. B., Chatham—MESS, etc.—B.A. 12/20—C. D. McCarthy, secy. Canadian Commercial Corp., 70 Lyon St., Ottawa, Ont., combined mess unit supply bldg., fire hall and bulk petroleum storage at R. C. A. F. Station, Tender G-19-C419. Approx. $500,000. Plans deposit $100.

CONTRACTS AWARDED

▲ **Mo., Kansas City**—RUNWAY—City, P. Wks., City Hall, Zone 6, paving, north-south runway at Municipal Air Terminal, to Perry McGlone Constr. Co., 1805 Grand St., Zone 8, $1,021,972. Awarded 11/20. CD 10/30, under LB.

PUBLIC BUILDINGS

BIDS ASKED

O., Dayton—OFFICERS TRAINING—B.A. 12/12—University of Dayton, Bro. A. O. Holian, bus. mgr., Dayton, 2 story, 20,000 sq. ft. brick reserve officers training corps bldg. Freeman A. Pretzinger, 1155 Reibold Bldg., archt.

Mass., Gardner—HOUSING—B.A. 12/13—City, Housing Auth., City Hall, ten 1 and 2 story bldgs., Proj. 200-3. $300,000. Plans deposit $100. Samuel Glaser Assoc., 105 Newbury St., Boston, archts. CD 10/2.

Ill., East St. Louis—HOUSING—B.A. 12/15—St. Clair County Housing Auth., James E. Hayes, exec. dir., 6 St. and Ohio Ave., brick, concrete housing, (A) John De Shields Homes, 500 units; (B) Roosevelt Homes, 300 units and (C) Villa Griffin, 100 units. $500,000. Plans deposit $50. Kennedy & Spencer, 929A Missouri Ave., archts. CD 4/13.

O., Dayton—SCHOOL—B.A. 12/15—Bd. Educ., C. L. Borghardt, clk., 232 N. Main St., 1 story school tentatively named Cornell Heights Elementary School, Cornell Dr., Newton Ave. and Campus Dr. Plans deposit $25. Schenck & Williams, Third Natl. Bldg., Zone 2, archts. CD 5/9.

▲ **Pa., Ambridge**—HOUSING—B.A. 12/15—Beaver Co. Housing Auth., Beaver, 2 story, brick, 100 family federal housing. $1,000,000. Plans deposit $25. Michael Baker & Assoc.-Shields, Baker Bldg., Rochester, archts. CD 9/14.

▲ **Pa., McKeesport**—HOUSING—B.A. 12/18—McKeesport Housing Auth., McKeesport, 2 story, bsmnt., frame, brick federal housing, $1,475,000. Celli & Flynn, 336½ 5 Ave., archts. CD 11/10.

▲ **Mich., Ann Arbor**—CLINIC—B.A. 12/19—Regents of University of Michigan, Robert Briggs, vice pres., Ann Arbor, superstructure brick, steel clinic bldg., $2,900,000. Bids 9/11 rejected. Giffels & Valet, Inc., 1000 Marquette Bldg., Detroit, archts. CD 9/1.

LOW BIDDERS

Mass., Westboro—SCHOOL—Town of Westboro, G. B. Russell, supt., rejected bids Nov. 9, school, Fisher St., L. B. $472,150. Will re-advertise. CD 11/21, under LB.

▲ **N. Y., New York**—HOUSING—New York City Housing Auth., 63 Park Row, Zone 7, Nov. 22, foundations and appurtenances for Throggs Neck Houses (Proj. No.

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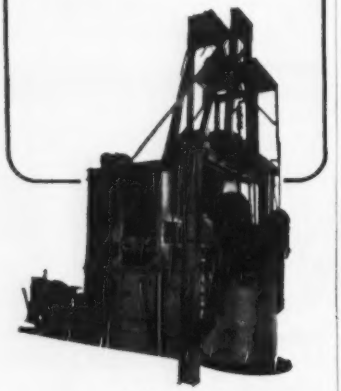

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UNIVERSAL CONCRETE MACHINERY CO.
297 South High Street — Columbus, Ohio

NY 5-15) in area bounded by E. 177 St., Balcom, Philip, Calhoun, Dewey, Swinton and Sampson Aves., Bronx Boro, from Slattery Contg. Co., 72-02 51 Rd., Woodside. $2,631,000. CD 11/2.

CONTRACTS AWARDED

Mo., Normandy (St. Louis 21, P.O.)—SCHOOL—Normandy Consolidated School Dist., Bd. Educ., W. E. Barnes, supt., 6701 Easton Ave., St. Louis, Zone 21, 2 story, ground floor, 34x66 ft. Garfield School addn.; 1 story, 55x67 ft. Harrison School addn.; 2 story, 24x80 ft. Washington School addn.; 2 story, ground floor, 32x66 ft. McKinley School addn.; 2nd floor, 59x94 ft. Lincoln School addn., to Geo. L. Cousins Contg. Co., 875 N. Skinker Blvd., St. Louis, Zone 5, $508,000. Bids 11/1. CD 10/25.

▲ **N. Y., Brooklyn**—COLLEGE—Bd. Higher Educ., Boylan Hall, Bedford Ave. and Avenue H, Zone 10, general contract Brooklyn College Center and Arts Building, Amerstort Pl., South Campus Rd. and the Brooklyn College Campus, to Warshaw Constr. Corp., and Henry M. Weitzner, Inc. and Warshaw Bros., Inc., 101 Park Ave., New York, Zone 17, $2,857,000. Bids 10/3. CD 9/28.

▲ **N. Y., Flushing**—HOUSING—New York City Housing Auth., 63 Park Row, New York, Zone 7, fdns. (3 bldgs. only) and general contract for Flushing Houses (Proj. NY 5-52), Long Island R.R., Lawrence St., Roosevelt Ave., Prince St. and westerly portions at 40 Rd. Main St. and Long Island R.R., to Corbetta Constr. Co., 220 E. 42 St., New York, Zone 17, $2,762,450. Bids 10/17. CD 10/19, under LB.

▲ **N. Y., Flushing**—HOUSING—New York City Housing Auth., 63 Park Row, New York, Zone 7, general contract Pomonok Houses, (Proj. No. NYC-221) in area bounded by 71 Ave., Kissena Blvd., 65 Ave. and Parsons Blvd., Queens Boro, to Bein, Willcox & Fish, 25-20 41 Ave., Long Island City, $12,250,000*** plumbing, to Lipsky & Rosenthal, Lexington Ave. and 115 St., New York, Zone 29, $1,497,000**electrical work, to Herman H. Schwartz, Inc., 391 Fulton St., Brooklyn, $759,750. Bids 9/26. CD 9/28, under LB ***heating and ventilating, to Jarcho Bros., Inc., 306 E. 45 St. New York, Zone 17, $1,397,000. CD 10/9. Grand total $15,903,750.

N. Y., New York—SCHOOL—Supt. School Buildings, Design & Constr., 49 Flatbush Ave. exten., Brooklyn, Zone 1, general contract, plumbing and drainage; heating and ventilating; electrical work and lighting fixtures for Morris High School addn., E. 166 St. between Boston Rd. and Jackson Ave., to Maran Constr. Co. Inc., 1910 Archer Ave., Zone 57, $644,700. CD 10/30, under LB.

Ore., Springfield—HIGH SCHOOL—School Dist. 19, Springfield, Junior High School, to Industrial Building Co., 940 Pacific Hy. North, Eugene, $429,700. Bids 11/9. CD 10/25.

COMMERCIAL BUILDINGS

BIDS ASKED

▲ **Ky., Louisville**—DEPARTMENT STORE—B.A. 12/15—Henry A. Marks & Dolph Hartveld, Union Trust Bldg., Cincinnati, O., 3 story, bsmnt., brick department store, incl. offices, $2,000000. J. C. Penney Co. 330 W. 34 St. New York, N. Y., lessee. CD 9/12.

N. M., Santa Fe—HOSPITAL—B.A. 12/15—St. Vincent's Hospital, 210 E. Palace Ave., hospital. $750,000. Meem, Zehner, Holien & Assoc., Box 628, archts.

▲ **Tex., Dallas**—OFFICE—Bids Asked—United American Insurance Co., 606 N. Field St., office. $1,000,000. George L. Dahl, 2101 N. St. Paul St., archt. CD 11/21.

SOON LETS CONTRACT

▲ **Ill., Harvey**—Y.M.C.A. BLDG.—19 S. LaSalle St., Chicago, Zone 3, soon lets contract $1,500,000. Burnham & Hammond, 4-53 W. Jackson St., Chicago, archts. CD 3/30.

Mich., Birmingham—CHURCH—First Methodist Parish, Rev. Dr. Arnold F. Runkel, 552 Madison St., soon lets contract 1 story, bsmnt., brick, stone church, West Maple and Pleasant Sts. $600,000. Andrew Morison, 713 Box Bldg., Detroit, archt. CD 10/3.

Mich., Pontiac—CHURCH—Grace Lutheran Parish, Pontiac, soon lets contract 1 story, bsmnt., brick stone church. $300,000. Earl L. Confer, 14000 Strathmore St., Detroit, archt.

Mo., Kirkwood (St. Louis 22, P.O.)—CHURCH—St. Peter's Catholic Parish ,Rev. Alphonse E. Westhoff, pastor, 219 W. Argonne Dr., soon lets contract, 1 story, bsmnt., 113x176 ft., brick, steel stone concrete church. Joseph D. Murphy, 4746 McPherson Ave., St. Louis, Zone 8, archt. CD 6/15.

Mo., St. Louis—NURSING SCHOOL—De Paul Hospital, Sisters of Charity, Sister M. Andrea, pres., 2415 N. Kingshighway, soon lets contract 9 story, bsmnt., brick, rein. con., stone, T shaped nursing school. Maguolo & Quick, 4908 Delmar Bldg., Zone 8, archts. CD 9/19.

Ont., Toronto—GROCETERIA—Loblaw Groceterias Co. Ltd., Fleet and Bathurst St., soon lets contract 1 story, bsmnt., rein.-con., structural steel, concrete block groceteria, Bayview and Moore Aves. $325,000. K. W. Bash, c/o owner, engr.

LOW BIDDERS

Mo., Pattonville—COTTAGE—Missouri Baptist Children's Home, Edgar E. Blake, supt., St. Charles Rock Rd. (U. S. 40) between U. S. 61 and Fee Fee Rd., rejected bids July 7, 2 story, part bsmnt., 45x160 ft., brick, asbestos siding, steel, concrete block, preschool cottage bldg. Will re-advertise. L. Baylor Pendleton and Wm. B. Ittner Inc., 408 Bd. Educ., Bldg., 911 Locust St., St. Louis, Zone 1, assoc. archts and engrs. CD 7/6.

CONTRACTS AWARDED

▲ **Ark., Fort Smith**—HOSPITAL—St. Edwards Mercy Hospital, 1411 Rogers St., hospital addns., to Harmon Constr. Co., 100 S. Indiana St., Oklahoma City, Okla. $1,260,000. Bids 9/28. CD 10/11, under LB.

Calif., San Jose—RESIDENCES—McKean Constr. Co., 1001 Bascomb Ave., 107 residences, Hedding St., Baywood Clower, Monroe and Forest. Owner builds. $856,000. CD 5/8/46.

Ind., South Bend—MORRIS INN—Notre Dame Universtiy, Campus, 3 story, bsmnt., face brick, concrete framing, stone Morris Inn, to Sollitt Constr. Co., 301 S. Columbia St., $950,000. Awarded 11/20. CD 10/23.

Mich., Grand Rapids—HOSPITAL—Blodgett Memorial Hospital, H. B. Tuthill, pres. Bd. Trustees, 1840 Wealthy St. S. E., brick, steel hospital addn., alterations, to Owen Ames Kimball Co., 38 Pearl St. N. W., $400,000. CD 10/6.

▲ **N. Y., Ithaca**—LABORATORY—Cornell University, College of Engineering, Ithaca, material testing labcratory, to White Constr. Co., 95 Madison Ave., New York, Zone 16, Approx. $1,386,000. Bids 11/3. CD 10/30.

Tex., Houston—DWELLINGS—John Taub, 3834 Wichita St., 50 dwellings in new area Oak Forest. Owner builds. Approx. $400,000. CD 11/3.

Ont., St. Catherines—HOSPITAL—Religious Hospitallers of St. Joseph, 158 Ontario St., 5 story, T-shaped Hotel Dieu Hospital addn., to Moir Constr. Co. Ltd., Box 476, St. Catherines, $772,000. Bids 10/16, awarded 11/20. CD 10/4.

INDUSTRIAL BUILDINGS

SOON LETS CONTRACT

Ky., Louisville—WAREHOUSE—Phillip Morris & Co. Ltd., 19 and Howard Sts., Zone 3, soon lets contract 7 story, rein.-con., 110x150 ft. warehouse, $600,000. Lockwood Greene Engineers, 10 Rockerfeller Plaza, New York, N. Y., engrs. CD 11/13.

Ont., Hamilton—POWER HOUSE, etc.—Dominion Foundries & Steel Ltd., Depew St., soon lets contract 1 story, 100x240 ft., rein.-con., brick, structural steel power house and maintenance bldg. $200,000. Prack & Prack, 310 Main St. E., archts. CD 2/15/49.

▲ **Ont., Toronto**—FACTORY, etc.—Frigidaire Products of Canada Ltd., Commercial Rd., Leaside, soon lets general and electric contract, superstructure 1 story 450x1,000 ft. factory, 2 story 80x450 ft. office wing. $7,000,000. A. G. Facey, 991 Bay St., archt. H. H. Angus & Assoc., and R. P. Allsop, 1221 Bay St., engrs.

Ont., Toronto—FACTORY—Lincoln Electric Co. of Canada Ltd., 179 Wicksteed Ave., soon lets contract 1 story, 140x320 ft., structural steel, brick factory exten. $300,000. Mathers & Haldenby, 15 St. Mary St., archts.

LOW BIDDERS

Tex., Dallas—SALES, SERVICE, etc.—Dick Price Motor Co., 2100 N. Harwood St., rejected bids Nov. 10, auto sales, service, shop, in Park Cities area, L. B. $128,000; auto service, sales, shop, Oak Cliff area $100,000. CD 11/9.

CONTRACTS AWARDED

▲ **Kan., Kansas City**—PLANT—Procter & Gamble, 19 and Kansas Sts., Zone 5, detergent plant units on 10 acre tract north of present plant, to Day & Zimmerman, Inc., Packard Bldg., Phila., Pa., Approx. $1,000 000 Elmer Payne, owners staff engr.

Mo., St. Louis—WAREHOUSE—Envelope Mfg. Co., 2809 Pine St., Zone 3, 1 story, 50x73 ft., brick, concrete, steel warehouse addn., 2815 Pine St., to E. Brunson Constr. Co., 4052 Forest Park Blvd., Zone 8, Schmidt & Paolinelli, Railway Exch., 611 Olive St., Zone 1, archts.

Mo., St. Louis—WAREHOUSE—Manhattan Real Estate Co., 1605 Locust St., Zone 3, 2 story, rein.-con. slab on ground, 108x290 ft. and 17x150 ft. office on second floor, 30x108 ft., rein.-con. brick warehouse, 3407 Choteau St., to Gamble Constr. Co., 804 Pine St., Zone 1, approx. $220,000, Neal J. Campbell, 911 Locust St., Zone 1, engr. Hugo K. Graf, 2825 Olive St., Zone 3, archt.

Mo., St. Louis—SHOP—Noxdorff-Krein Mfg. Co., 900 Howard St., Zone 6, 1 and 2 story, 59x89 ft., concrete block, rein.-con. machine shop addn. for plant, to W. D. Errant, 102 N. Eight St., Zone 1, Paul Klingensmith, 4232 W. Pine Blvd., Zone 8, archt.

▲ **N. Y., Rochester**—FACTORY—Fort Wayne Corrugated Paper Co., 130 E. Douglas St., Fort Wayne, Ind., 1 story, 110,000 sq. ft. steel brick factory, paper converting plant, mechanically ventilated, to Austin Co., 16112 Euclid Ave., Cleveland, O., Approx. $1,250,000

Pa., Pittsburgh—WAREHOUSE—H. Childs & Co., Inc., 813 Penn Ave., 2 story 100x150 ft., steel brick block warehouse, to D. T. Riffle, Inc., 1006 Forbes St., Approx. $100,000. Bids 11/14. CD 11/3.

Pa., Shaler Twp.—WAREHOUSE—Elfinwild Corp., c/o general contractor, 1 story, 121x185 ft. concrete block warehouse, steel columns, to Uhl Constr. Co., Allison Park. Approx. $85,000.

Tex., Houston—FREIGHT TERMINAL—The Broadway Express, Inc., 3816 Woodleigh St., truck freight terminal, to Neal Constr. Co., 3918 McKinney St. $185,000.

Tex., Houston—PLANT—So-Life Jalousie Co., City Natl. Bank Bldg., plant, to Neal Constr. Co., 3918 McKinney St., $83,115.

Alta., Edmonton—WAREHOUSE—Newhouse Wholesale Ltd., Tees & Persse Bldg., 1 story, 121x199 ft., steel, masonry warehouse, to Century Constr. Co., 10258 97 St., Approx. $100,000. Stanley & Stanley, 10012 102 St., archts.

Ont., Hamilton—PLANT—Hoover Co. Ltd., Gage Ave. North, 1 story, 23,000 sq. ft. plant addn., to W. H. Cooper Constr. Co. Ltd., 21 Hunter St. East, Approx. $200,000. Awarded 11/21.

▲ Ont., Marathon—PLANT—Marathon Paper Mill of Canada Ltd., Marathon, chlorine plant, to Leonard Constr. Co., 37 S. Wabash St., Chicago, Ill., U.S.A. $3,000,000. CD 11/1.

Ont., Toronto—FACTORY—Fyfe Oil Filters Ltd., 11 Wabash Ave., 24,000 sq. ft. factory addn., to R. G. Kirby & Sons Ltd., 539 Yonge St., $200,000. Awarded 11/21. John B. Parkin Assocs., 717 Church St., archts.

UNCLASSIFIED

BIDS ASKED

N. Y., Wantagh — DOG POUND — B.A. 12/12 — Town Clerk, Town Hall, Hempstead, dog pound. $200,000. Sagow & Heidelberger, 658 Fulton Ave., Hempstead, archts.

† Missouri—TRANSMISSION LINES—B.A. 12/13—Southwestern Power Admin., P.O. Drawer 1614, Tulsa, Okla., 43 mi. 154 KV H frame transmission line from Mansfield to Springfield, $175,000. Plans deposit $15.

N. S., Pictou—HARBOR FACILITIES—B.A. 12/13—Acting Secy. Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., restoration harbor facilities (Pier C). Approx. $200,000. Plans deposit $50. R. Blais, c/o owner, engr.

Que., Paspebiac—HARBOR REPAIRS, etc.—B.A. 12/13—Acting Secy. Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., harbor repairs, Imprvs. Approx. $180,000. Plans deposit $25. R. Blaise, c/o owner, engr.

Que., Pointe au Pic—WHARF—B.A. 12/13—Acting Secy., Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., wharf repairs, enlargements, Approx. $200,000. Plans deposit $20. R. Blais, c/o owner, engr.

† South Dakota—TRANSMISSION LINES—B.A. 12/14—Bureau Reclamation, Dpt. Interior, Huron, construct Huron-Fort Randall-Armour-Gavins Point-Sioux Falls-Brookings 115 kilovolt transmission lines, Missouri River Basin Proj. Transmission Div., Spec. DC 3243.

† N. C., Camp Lejeune—NET MOCK UPS—B.A. 12/15—Pub. Wks. Office, Bldg. 1005, Marine Barracks, 2 dry net mock-ups at Marine Barracks, Spec. 25879. Plans deposit $10.

† Montana—TURBINE TYPE PUMPING UNITS—B.A. 12/19—Bureau Reclamation, Dpt. Interior, Bldg. 1 A, Denver Federal Center, Denver, Colo., 4 electric-motor driven deep-well, turbine-type pumping units, 2 electric-motor-driven centrifugal-type water pumping units, 2 electric-motor driven, gear type oil pumping units Canyon Ferry Power Plant, Missouri River Basin Proj., Spec. DS 3245, L. N. McClellan, Bldg. 1 A, Denver Federal Center, Denver, Colo., ch. engr.

† South Dakota—TRANSMISSION LINES—B.A. 12/19—Bureau Reclamation, Dpt. Interior, Huran, Brookings-Watertown-Groton-Huron 115 kilovolt transmission lines, Transmission Div., Missouri River Basin Proj. Spec. No. DC-3246.

† La., Port Hudson—CEMETERY IMPRVS.—B.A. 12/21—U. S. Eng., 606 Santa Fe Bldg., Galveston, Tex., cemetery road, erect flagpole in Port Hudson National Cemetery, near Baton Rouge, East Baton Rouge Parish, Eng. 41-243-51-19. Plans deposit $10, Ellsworth I. Davis, dist. engr.

† Montana—TRANSMISSION LINE—Bids asked—Bureau Reclamation, Dpt. Interior, Bldg. 1 A, Denver Federal Center, Denver, Colo., 82 mi. 115,000 volt backbone transmission line from Cayon Ferry Power Plant, under Missouri River 17 mi. east of Helena to Great Falls.

CONTRACTS AWARDED

Ky., Brandenburg—RAILWAY SPUR—Louisville & Nashville R. R. Co., C. H. Blackman, ch. engr., 9 and Broadway, Louisville, railways spur into Mathieson Chemical Co. plant, to J. C. Codell Constr. Co., Winchester, $157,000. CD 8/21.

Louisiana—GASOLINE PIPE LINE—United Gas Pipe Line Co., 1525 Fairfield St., Shreveport, La., 8 mi. 2 in. gasoline pipe line, appurtenances, Koran south to Elm Grove, own forces. $65,000. CD 2/27/48.

Nebraska—RURAL DISTRIBUTION LINES—Loup River Public Power Dist., Columbus, 70 mi. rural distr. lines, Holt, Rock and Brown Counties to Cannonwealth Electric Co., 1901 Y St., Lincoln, $580,000. Bids 11/8. CD 10/26.

▲ Texas—GAS GATHERING LINES—Sunray Oil Co. & Associated Operators, Philtower Bldg., Tulsa, Okla., 70 mi. 6- to 24-in. low pressure gas gathering lines and 40 mi. 30 in. gas gathering lines, in Snyder area, to Vaughn & Taylor Constr. Co., Snyder, $2,625,000. CD 11/24, under LB.

▲ Texas—GAS PIPE LINE—Transcontinental Gas Pipe Line Corp., Oil & Gas Bldg., Houston, 61 mi. 6-to 10-in. natural gas pipe line in Dix area, near El Campo, to Victoria Oil Field Maintenance Co., Victoria, Approx. $319,000***38 mi. 4- to 8-in. natural gas pipe line, Sinton area to Shanks & Eustace, Inc., Sinton, Approx. $240,000***58 mi. 4- to 14-in. natural gas pipe line from Sinton to El Campo, to T & R Constr. Co., Sinton, Approx. $480,000***98 mi. 6- to 14-in. natural gas line, Wharton area to Altgelt Constr. Co., Wharton, Approx. $985,000. Grand total $2,024,000. CD 3/28/46.

Tex., Galveston—LIGHTING UNIT—City, street lighting unit on Broadway, own forces. $90,000. George E. Harris, city engr. CD 5/12.

Tex., Tyler—ELECTRIC LINES—Texas Power & Light Co., Interurban Bldg., Dallas, electric transmission

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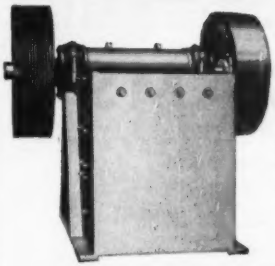

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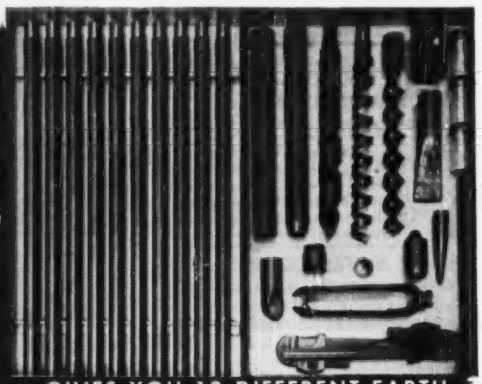

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PROPOSED PROJECTS

WATER SUPPLY

Ala., Talladega—City, filtration plant and tanks, $600,000. J. W. Goodwin Eng. Co., 726 S. 29 St., Birmingham, consult. engr.

Mo., Missouri City—Northwest Electric Power Co-operative, Cameron, water supply sys., incl. road fill, deep well, pump, piping, water mains, water storage tank, $150,000. Lutz & May, Finance Bldg., Kansas City, Mo., consult. engrs. CD 3/2 under Unclassified, Missouri.

▲ **S. C., Charleston**—Comrs. Pub. Wks., 14 George St., reservoir and canal for 2,500,000,000 gal. industrial water near North Charleston. $4,415,000. Ford, Bacon & Davis, Inc., 39 Broadway, New York, N. Y., consult. engr. CD 7/31.

† **S. D., Igloo**—U. S. Eng., First and Douglas Sts. N. W., Wash. 25, D. C., water supply sys. imprvs., Black Hills Ordnance Depot. $150,000.

Tex., Corsicana—City, defeated bonds, water supply well, $35,000; water extens., sys. rehabilitation, $90,000. Hubert T. Braselton, city engr. CD 10/30.

Wash., Pasco—City, City Hall, 7,000 ft. 12- to 20-in. water mains, from filtration plant to water tank, cross-town line thru business district and addnl. 500,000 gal. elevated steel tank, $350,000. John W. Cunningham & Assocs., Spalding Bldg., Portland, Ore., consult. engrs. CD 11/19/45.

Wash., Seattle—City, County-City Bldg., water mains in 26 Ave. S.W., $87,124; in Myrtle St., $40,916. R. W. Finke, city engr. CD 5/2/45.

SEWERS, WASTE DISPOSAL

Ark., North Little Rock—Rose City Sewer Dist., North Little Rock, sewerage sys. $110,000. Glenn Douglas, Pyramid Bldg., Little Rock, consult. engr.

Conn., Groton—Boro. P. Wks. Dpt., Groton, sewage treatment plant. $395,250. Metcalf & Eddy, 1300 Statler Bldg., Boston, Mass., consult. engrs. CD 3/10.

Ill., Kankakee—City Bd. Imprvt., sewer imprvs. for Sunnyside Subdivision. $160,000. Warren & Van Praag, Decatur, consult. engrs. CD 4/19/48.

Ill., Sparta—City, City Hall, sewage disposal plant, equip., etc. $325,000. Rochester & Goodell, Salem, consult. engrs.

Mich., Lincoln Park—City, John M. O'Connor, city clk., voted bonds Nov. 7, constr. Emmons Blvd. Pumping Station addn., imprv. Lincoln Blvd. sewers, etc. $475,000. Pate & Hirn, 932 Michigan Bldg., Detroit, consult. engrs. CD 1/6/49.

O., Berea—City, voted $200,000 bonds, trunk sewer. CD 10/17.

O., Bryan—City, defeated $425,000 bonds Nov. 7, sewer expansion program. CD 9/15.

O., Cleveland—Cuyahoga Co., Court House, voted bonds Nov. 7, sewage study. $500,000. CD 4/7.

O., Maumee—Village, voted $39,000 bonds, sewer program. $650,000.

Ore., Albany—City, City Hall, voted $500,000 bonds, sewage treatment facilities. Cornell, Howland, Hayes & Merryfield, 1600 Western St., Corvallis, consult. engrs. Harold W. Poling, city engr. CD 8/18.

Pa., Duquesne—City, sewage disposal plant, $450,000. Gannett Fleming Corddry & Carpenter, Inc., 110 Shady St., Pittsburgh, engr.

Pa., Phoenixville—Phoenixville Boro, Boro Hall, voted $475,000 bonds Nov. 7, sewerage installations. CD 12/28/45.

R. I., Providence—City, City Hall, voted $400,000 bonds, sewers. CD 10/6/48.

S. C., Liberty—City, sanitary sewer addns. $100,000. Patchen & Zimmerman, Daniel Field Fairport, Augusta, Ga., consult. engrs.

Tex., Bonham—City, bond election, Dec. 23, sewage disposal plant. $100,000. CD 11/13.

Tex., San Angelo—City, addnl. sanitary sewers. $550,000. Freese & Nichols, 407 Danciger Bldg., Fort Worth, consult. engrs.

BRIDGES

Wash., Port Townsend—Jefferson Co., Court House, voted bonds, deck girder bridge with rein.-con. box girder approaches from Hadlock to Indian Island, $234,000. H. Hadley, Seaboard Bldg., Seattle, Zone 1, consult. engr., K. F. Jones, co. engr.

▲ **Wash., Tacoma**—City, City Hall, voted bonds, bridge across Port—Industrial Waterway, $1,000,000. D. E. Morris, city engr. CD 9/5.

Continued on page 114

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(Continued from page 112)

STREETS AND ROADS

▲ **Arkansas**—State Hy. Dpt., Little Rock
Saline Co.—4-lane highway from Little Rock to Benton, $2,500,000. Alfred E. Johnson, hy. engr.
▲ **Ill., La Salle**—La Salle Co., defeated $2,500,000 bonds, general road imprvs. George L. Farnsworth, La Salle, co. supt. hys. CD 8/3.
Ill., Waukegan—City, repaving S. Sheridan St., $440,000. CD 4/8/46.
▲ **O., Lorain**—City, City Hall, voted bonds Nov. 7, street imprvt. $1,100,000. CD 11/22/49.
▲ **Oklahoma**—State Hy. Dpt., Capitol, Oklahoma City, **Seminole Co.**—new cut off for U. S. 270 between Seminole and Holdenville via Wewoka. $1,250,000. S. K. McClelland, c/o owner, engr.
Pa., Allentown—AIRPORT—Allentown-Bethlehem Airport, Allentown, site preparation, paving, lighting and misc. work. $425,000. A. H. Wessel, Harrisburg State Airport, New Cumberland, CAA Dist. Airport Engr.
Tex., Pear Ridge—City, voted bonds, Nov. 14, 12 mi. inverted penetration type street paving. $100,000.
Wash., Tacoma—City, City Hall, defeated bonds, roadway and seawall on Ruston Way and approach ramps to 11 St. bridge, $650,000; widn. S. 56 St., $160,000, N. Stevens St. $90,000 and S. M St., $50,000. D. E. Morris, city engr. CD 9/22.

EARTHWORK, WATERWAYS

▲ **Idaho**—Idaho Power Co., 1220 Idaho St., Boise, 56 hydro-electric dams on Snake River between Weiser and Hells Canyon, proposed for construction in 1952 and later. $175,000,000.
▲ **British Columbia**—British Columbia Electric Co., 425 Carroll St., Vancouver, hydro-electric project, 80,000 h.p. hydro-electric unit, incl. 13,500 ft. long tunnel, powerhouse, rockfill dam, $8,000,000; 230,000 volt transmission line and associated equip., $2,000,000, at Jones Lake, between Rosedale and Hope. Thos. Ingledow, 425 Carrall St., Vancouver, engr. CD 6/3/49.

AIRPORTS

† **O., Dayton**—WHIRLRIS FACILITIES—U. S. Eng., First and Douglas Sts. N. W., Wash. 25, D. C., high powered electric whirlrig facilities, Wright-Patterson Air Force Base. $782,000. CD 10/26/48.
† **S. D., Rapid City**—AIRFIELD LIGHTING, etc.—U. S. Eng., First and Douglas Sts. N. W., Wash. 25, D. C., airfield lighting and razard removal, Rapid City Air Force Base. $401,100. CD 10/26/48.
† **Tex., Forth Worth**—AMMUNITION STORAGE—U. S. Eng., First and Douglas Sts. N. W. Wash. 25, D. C., ammunition storage, Carswell Rir Force Base. $495,000.

LATIN AMERICA

▲ **Mexico, Mexico City**—Austin Motor Co., c/o Leonard P. Lord, chn., Birmingham, England, plans automobile assembly plant. $32,500,000.
Mexico, Mexico City,—F. T. I la Catolica, 2, Mexico City, plans actors' hospital. $400,000.

PUBLIC BUILDINGS

▲ **Ala., Lannett**—HOUSING—Lannett Housing Auth., Lannett, plans by Tsombs & Co., 127 Walton St. N.W., Atlanta, 200 housing units. $1,500,000. CD 2/28.
Ark., Conway—HOSPITAL—City, bond election Dec. 12, hospital. $580,000. CD 3/10.
Calif., Downey—SCHOOL IMPRVS.—Downey Elementary and High School Dist., voted $750,000 bonds, school imprvs. CD 10/16.
Calif., El Centro—HOUSING—El Centro City Housing Auth., El Centro, plans by Frank C. Hyde, 107 E. 5 St. El Centro, 50-unit housing, First and Holt Sts. $500,000.
Calif., Fontana—SCHOOLS—Fontana Elementary School Dist., Arrow Blvd. and Mango St., plans by J. Dewey Harnish, 212 East B St., Ontario, frame, stucco, brick School A, 21,000 sq. ft.; School B 16,000 sq. ft.; School C 16,000 sq. ft., Approx. $500,000. CD 4/14.
Calif., San Diego—JUVENILE HALL—Bd. Supervs. Los Angeles Co., Civic Center, voted $875,000 bonds, juvenile hall. CD 10/17.
▲ **Calif., Ventura**—ADMINISTRATION, etc.—Bd. Supervs. Ventura Co., Court house, voted $1,250,000 bonds, 4 story administration and 80-bed hospital, $1,587,100, incl. equip. CD 10/13.
Conn., Milford—SCHOOL—Town, Harold Paterson, chn., New Milford, brick, steel school, Fort Hill Fairgrounds, $792,000.
▲ **D. C. Wash.**—EXPERIMENTAL LOADING, etc.—U. S. Eng., First and Douglas Sts., N. W., Wash. 25, D. C., experimental loading and filling bldg. $290,000; low temperature test chambers, $325,000; process laboratory, $369,000; storage bldg. and laboratory, $58,000; laboratory, $151,000; duct sys., $98,900; protective equip. laboratory, $400,000; high pressure laboratory, $25,000; explosion test chamber, $400,000; facilities for assembly of fire bomb clusters, $301,000, at Army Chemical Center.
Ill., Coal Valley—HOSPITAL WING—Rock Island Co., c/o Bd. Co. Supervs., Court House, 15 St. and 2 Ave., voted $750,000 bonds, concrete convalescent wing to county hospital. CD 8/18.
▲ **Ill., Dundee**—SCHOOLS—School Dist. 300, c/o High School, project abandoned, 2 grade schools and 1 high school, $1,000,000. Bradley & Bradley, 22650 S. Main St., Rockford, archts. CD 8/10.
Ill., Gibson City—SCHOOL—Bd. Educ., Gibson City, plans by Lundeen & Hillfinger, Bloomington, community unit school remodeling present high school into grade school, constr. high school, remodeling present high school by new room addns., constr. grade school $850,000-$875,000
Ill., Kenilworth—SCHOOL—School Dist. 38, Village Hall, plans by Perkins & Will, 309 W. Jackson St., Zone 6, school, Cumberland Ave. $600,000.
Ia., Waterloo—COUNTY HOME—Black Hawk Co., Waterloo, voted $520,000 bonds, 3 story, 100 x 142 ft., steel frame, brick, concrete cut-stone county home. Ralston & Ralston, Waterloo, archts. CD 10/27.
▲ **Kan., Garden City**—SCHOOL—School Dist. 1, voted bonds, Nov. 7, high school and Junior College, $1,000,000. J. W. Radotinsky, 1401 Fairfax Trafficway, Kansas City, Kan., archt. CD 10/25.
Ky., Catlettsburg—JAIL—City, voted bonds, jail and remodel court house, $800,000.
Ky., Danville—HOUSING—Danville Housing Auth., plans by Gillig, Watkins & Wilson, 180 Walnut St., Lexington, 70 housing units. $500,000.
▲ **Ky., Lexington**—HOUSING—Lexington Housing Auth., plans by Gillig, Watkins & Wilson, 180 Walnut St., 600 housing units. $4,000,000. CD 11/21.
Ky., Richmond—HOUSING—Richmond Housing Auth., plans by Gillig, Watkins, & Wilson, 180 Walnut St., Lexington, 75 housing units. $550,000.
La., Donaldsonville—SCHOOL—Ascension Parish School Bd., voted bonds, school imprvs. $508,000.
La., Rayne—HOUSING—Rayne Housing Auth., 75 housing units. $500,000.
† **Md., Carderock**—LABORATORY—Bureau Yards & Docks, Pub. Wks. Officer, Naval Gun Factory, Wash., D. C., plans by Justement, Elam & Darby, 2011 K St. N.W., Wash., D. C., laboratory, roads and services for wind tunnel David Taylor Model Basin, $500,000. CD 7/26/48.
▲ **Md., Loch Raven**—SCHOOL—State, Dpt. P. Imprvts., 506 Park Ave., Baltimore, Zone 1, imprvts. at Maryland Training School for Boys, incl. masonry service bldg., $450,000; gymnasium and auditorium, $442,000; 2 masonry junior cottages, $405,000; junior school, $230,000; masonry staff quarters, $400,000. John B. Funk, 506 Park Ave., Baltimore, Zone 1, ch. engr. CD 2/14/45.
▲ **Mass., Springfield**—HOSPITAL—City, P. Welfare Dpt. Dr. W. A. R. Chapen, chn., plans by Coolidge, Shepley Bulfinch & Abbott, 1 Court St., Boston, brick, steel concrete municipal hospital. $10,000,000. CD 8/12/48.
Minn., Moorhead—COURT HOUSE—Clay Co., W. D. Johnson, aud., voted $500,000 bonds Nov. 7, court house. CD 8/18.
Miss., Meridian—HOSPITAL—State Bldg. Comn., Jackson, plans by D. B. Shourds, Great Southern Hotel, Gulfport, and W. L. Rosamond, Columbus, convalescent ward, $600,000, plans by Chris Risher, Vise Clinic Bldg., service bldg. $370,000 both at East Mississippi State Hospital. CD 11/17/48.
▲ **Mo., Clayton (St. Louis 5, P.O.)**—SCHOOL—Clayton School Dist., J. L. Bracken, supt., 7500 Maryland Ave., bond election Dec. 12, brick, concrete, steel high school on 21 acre tract on Topton way, south of Maryland Ave. $1,800,000, Wm. B. Ittner, Inc., 408 Bd. Educ., Bldg., 911 Locust St., St. Louis, Zone 1, archts. CD 2/10/47.
Mo., Milan—HOSPITAL—Sullivan Co., c/o Hospital Comr., P. M. Marr, First National Bank Bldg., plans by Hewitt & Rover, 1203 Locust St., Kansas City, Mo., 1 story, part bsmt., brick, concrete, 20,000 sq. ft. hospital, $500,000. CD 10/26.
▲ **Mont., Boulder**—SCHOOL—State, combination hospital and infirmary 2 girls' and 2 boys' dormitories, power house, at State training School, $1,325,000. CD 9/13/45.
Mont., Livingston—HOSPITAL—Park Co. plans by Cushing & Terrell, Billings, hospital. $590,000.
▲ **Mont., Warm Springs**—HOSPITAL—State, receiving hospital, men's and women's dormitories, WW., road and driveway repairs at Warm Springs State Hospital. $1,835,000. CD 8/22/46.
N. J., Dover—SCHOOL—Bd. Educ., Dover, 1 story school, at either East Field, West Field or Hamilton Field. $650,000. CD 12/4/46.
N. J., Florence—HOUSING—Florence Housing Auth., plans by Henry W. Petty, 141 Chestnut St., Moorestown, housing development. $500,000. CD 10/31/46.
N. Y., Flushing—LIBRARY—Dpt. P. Wks., Municipal Bldg., New York, Zone 7, plans by Sterner & Overhandler, 114 E. 32 St., New York, Zone 16, 2 story public library, Kissena Blvd. and Main St., Proj. L-41. $700,000. CD 8/31/45.
N. Y., Hammond—SCHOOL—Central School Dist. 1, Hammond, plans by Carl W. Clark, 625 James St., Syracuse, Central School for Hammond, Macomb, Rossie and Morristown. $598,000. CD 7/12/46.
▲ **N. Y., New York**—HOUSING—New York City Housing Auth., 63 Park Row, Zone 7, plans by Rogers & Butler, 219 E. 44 St., Zone 17, Edenwald Housing, 40 buildings and crafts bldg. in blocks bounded by Grenada Pl., Baychester Ave., Schieffelin Ave., 229 St., Laconia Ave. and 225 St. $16,034,500. CD 3/18/48.

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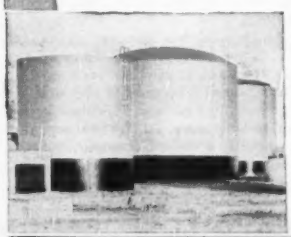

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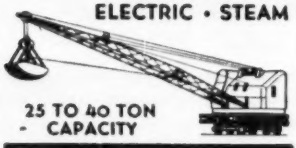

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N. C., Thomasville—HOSPITAL—City Memorial Hospital, N. C. English, chn., Thomasville, 40 bed hopsital addn. $600,000.

O., Ashtabula Harbor—SCHOOL—Ashtabula Harbor Exempted Village Bd. Educ., Ashtabula Harbor, voted $650,000 bonds Nvo. 7, school imprvs. CD 10/13.

O., Barberton—CITY HALL—City, voted $500,000 bonds Nov. 7, city hall. CD 8/21.

O., Carlisle—SCHOOL—Bd. Educ., Carlisle, voted $750,000 bonds Nov. 7, school. CD 7/24, under O., Franklin.

O., Dayton—SCHOOLS—Bd. Educ., Van Buren Twp. School Dist., Dayton, voted $865,000 bonds Nov. 7, 12 room addn. to Fairmount high school and addnl. elementary classrooms. CD 10/13.

O., Eaton—SCHOOL—Bd. Educ., Eaton, voted $545,000 bonds Nov. 7, school expansion program. CD 3/10.

O., Martins Ferry—HIGH SCHOOL—Bd. Educ., Martins Ferry, voted $600,000 bonds Nov. 7, high school. CD 3/28/46.

O., Maple Heights—SCHOOLS—Bd. Educ., Maple Heights, voted bonds Nov. 7, school addns. $520,000. CD 12/4/47.

O., Maumee—SCHOOLS—Bd. Educ., Maumee, voted $650,000 bonds, replace sects. both Union and Ft. Miami Grade Schools, other bldg. imprvs. CD 10/18.

O., New Phila.—SCHOOL—Bd. Educ., New Philadelphia, voted $640,000 bonds, Nov. 7, school imprvs.

† O., Toledo—FIREPROOFING WAREHOUSES—U. S. Eng., First and Douglas Sts. N. W., Wash. 25, D. C., fireproofing 13 warehouses, Rossford Ordnance Depot. $500,000.

O., Uhrichsville—SCHOOL—Bd. Educ., Uhrichsville, voted $509,500 bonds Nov. 7, school.

O., Upper Arlington—SCHOOL—Bd. Educ., Upper Arlington, voted $506,000 bonds Nov. 7, school, Tremont Rd. CD 10/25.

O. Vermillion—SCHOOL—Bd. Educ. Vermillion, voted $544,000 bonds Nov. 7, school building program. CD 12/8/47.

Okla., Ponca City—SCHOOL—Bd. Educ., Ponca City, plans by Timberlake & Kannady, Ponca City, voted bonds, addnl. school. $485,000. CD 10/17.

Pa., Beaver Falls—HOUSING—Beaver Co. Housing Auth., Beaver, plans by Frank Dickerson, 1902 7 Ave., Beaver Falls, 1 and 2 story, 100 unit brick housing. $850,000.

Pa., Kennerdell—SCHOOL—Victory Joint School Dist., Kennerdell, plans by Wm. Holmes Crosby, 49 Maple Ave., Oil City, brick, block, steel frame grade and high school. $500,000.

Pa., Media—COURT HOUSE, etc.—Comrs., Delaware Co., Media, plans by Morris Whiteside, Sharon Hill, court house and garage addns. $500,000.

Pa., West Mifflin—SCHOOLS—Bd. Educ. West Mifflin, Terrace, voted bonds, Walnut Grove School. $300,000; 2 story, bsmht. Homeville School, $600,000. Button & McLean, 319 E. Montgomery Ave., Pittsburgh, archts. CD 10/6.

S. D., Rapid City—AUDITORIUM—City, auditorium. $600,000. Julian Staven, Rapid City, consult. engr.

Tex., Carthage—COURT HOUSE—Panola Co., c/o Court House Carthage, voted bonds, court house and jail. $500,000. CD 10/25.

Tex., Houston—PARKING GARAGE—Harris Co., Court House, plans by Finger & Rustay, 711 Natl. Standard Bldg., public parking garage. $500,000 CD 9/25.

Tex., Hutchins—HOUSING—Hutchins Housing Auth., Hutchins, 75 unit low cost housing. $600,000.

Tex., Richmond—COURTHOUSE—Fort Bend Co., H. Cecil Baker, judge, Richmond, plans by Golemon & Rolfe 915 Woodrow St., Houston, court house remodeling, imprvs., air conditioning. $450,000.

▲ Tex., San Antonio—SCHOOLS—San Antonio Independent School Dist., Lavaca and Matagorda Sts., plans by Phelps & DeWees & Simmons, 1501 Majestic Bldg., and Julian & White, 2901 Transit Tower, 24-room DeZavala School $400,000, R. C. Rippstein, Transit Tower, consult. engr.; plans by Phelps & DeWees & Simmons, 1501 Majestic Bldg., Leo M. J. Dielman, 300 E. Market St., and R. Vander Straten, 646 Milam Bldg., Highland Hills School $375,000, Floyd A. Covington Co., 209 Travis Bldg., consult. engr.; plans by Phelps & De Wees & Simmons, 1501 Majestic Bldg., school, Babcock and St. Cloud Rds., $200,000, W. E. Simpson Co., Milam Bldg., consult. engr. CD 6/29.

Va., Arlington—SCHOOL—Bd. Educ., Arlington Co., Arlington plans by J. M. Walton & Assoc., 2030 16 St., addn. and remodelling Hoffman Boston School, 1 and 3 story, reim.-con., brick, cinder block, steel, incl. gymnasium and auditorium, 30 x 60 ft. swimming pool, 14 Rd. and Queen St., $500,000. CD 10/14/49.

▲ Va., Clintwood—SCHOOLS—Dickenson Co., School Bd., c/o J. M. Skeen, supt., plans by Frantz & Addkison, State and City Office Bldg., Roanoke, Ervinton School, $360,000; Hayst School, $431,000; Clintwood School, $409,000. CD 3/25/48.

Wash., Ephrata—SCHOOLS—School Bd., Ephrata, $80,000 special levy and $125,000 in bonds voted Nov. 7 to be used with $342,000 federal funds and expected state aid, high school $750,000; grade school, $230,000. W. H. Rothe, Liberty Bldg., Yakima, archt. CD 10/5.

Wash., Pullman—SCHOOL—School Bd., voted $100,000 bonds high school addn., $500,000. Funk, Molander & Johnson, S. 7 Wall St., Spokane, archts. CD 10/16.

Wash., Quincy—SCHOOL—School Bd., Quincy, voted $100,000 bonds Nov 7, school, $421,000. W. H. Rothe, Yakima, archt. CD 8/11.

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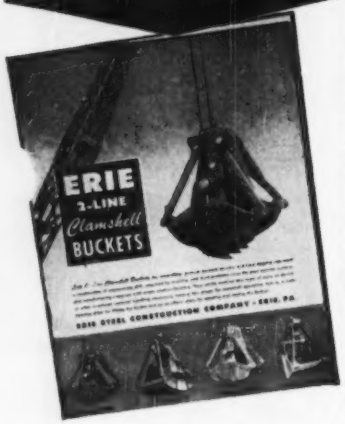

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▲ **Wash., Seattle**—CITY LIGHT—City, County—City Bldg., Seattle, Zone 4, 7 story city light bldg. addn. $1,300,000.

Wash., Shelton—SCHOOL—School Dist. 309, Shelton, voted bonds school, $575,000. CD 9/28.

▲ **Wash., Warden**—SCHOOL—School Bd., Warden, voted $50,000 bonds, Nov. 7, school $1,000,000. CD 12/2/48.

▲ **W. Va., Charleston**—HOUSING—Charleston Housing Auth., S. Clyde Jarrett, dir., Charleston, plans by Associated Housing Archts. Attn., Glenn Hancock, chn. Assn., Davidson Bldg., Zone 1, 500 housing units, $5,000,000. CD 11/11/49.

▲ **Alta., Edmonton**—SCHOOL—Public School Bd., H. G. Turner, secy., plans by Rule, Wynn & Rule, 300 Birks Bldg., school unit 105 St. and 72 Ave., Approx. $1,200,000.

B. C., New Westminster—HOSPITAL—Province of British Columbia, Parliament Bldgs., Victoria, plans by C. Campbell, Parliament Bldgs., three 100-bed units, each 2 story, rein.-con. hospital for insane addns. $750,000.

▲ **B. C., Vancouver**—LABORATORY, etc.—Province of British Columbia, Parliament Bldgs., Victoria, plans by C. Campbell, Parliament Bldgs., Victoria, 6 story, rein.-con. laboratory and public health bldg. $1,000,000.

▲ **Ont., Toronto**—NURSES RESIDENCE—Hospital for Sick Children 67 College St., Toronto, plans by Allward & Gouinlock, 57 Bloor St. W, 6 story, bsmnt., 83 x 90 ft., rein.-con., steel brick nurses residence, Elm and Elizabeth Sts. $1,500,000. Wallace, Carruthers & Assoc., 35 Isabella St., engrs. Stone & Webster Canada Ltd., 50 King St. W., project managers.

▲ **Ont., Toronto**—HOSPITAL—York Twp., H. A. Hall, clk., 2700 Eglinton Ave., W., 2 story, bsmnt., 400 bed Northwestern General Public Hospital, Keele St. and Strachan Ave. $1,000,000.

▲ **Que., Kenogami**—HOSPITAL—Province of Quebec, Ministry of Health, Quebec City, hospital for Kenogami-Jonquier, Arvida District, $1,000,000.

COMMERCIAL BUILDINGS

Calif., Beverly Hills — OFFICE — Wilshire-Crescent Dr. Corp., c/o E. L. Alberts, archt. 1846 S. Broadway, Los Angeles, 41,500 sq. ft. office, $500,000.

Calif., Los Angeles—DWELLINGS—Rosemead Gardens Co., 6307 Wilshire Blvd., 66 frame, stucco dwellings, Mismer Ave. and McDonald St. $530,000. Southwest Drafting Service, 2724 W. Florence Ave., archts.

▲ **Calif., Willowbrook**—DWELLINGS—Olive Gardens Inc., 510 S. Spring St., Los Angeles, plans by Wm. H. Fair, 124 W. 4 St., Los Angeles, 162 frame, stucco dwellings in Tract 17030, $1,344,600.

Fla., Miami—APARTMENT-HOTEL—Lord Calvert Apartment Hotel c/o M. Tony Sherman, archt., 732 N.E., 79 St., apartment-hotel. $500,000.

N. J., Camden—MEDICAL ARTS—Meyer & Julius Cabnet, 112 N. 7 St., plans by Dante J. D'Anastasio, 1815 Federal St., 5 story medical arts bldg. $800,000.

▲ **N. Y., Forest Hills**—APARTMENT—Blair Hall, c/o Tito Di Vincenzo, archt., 254 W. 54 St., New York. Zone 19, 6 story, 210 family apartment in area bounded by Queens Blvd., 66 Ave., 99 St. and 65 Rd. $1,800,000.

▲ **N. Y., Jackson Heights**—APARTMENT—E. & M. Greenway, c/o Erwin Gerber, archt., 1180 Raymond Blvd., Newark, N. J., 6 story apartment in area bounded by 32 Ave., 91 St. Northern Blvd. and 92 St. $1,029,600.

▲ **N. Y., Jackson Heights**—APARTMENTS—E & M Greenway, c/o Erwin Gerber, archt., 1180 Raymond Blvd., Newark, N. J., 5 apartments in area bounded by 32 Ave., 88 St., Northern Blvd. and 92 St. $7,772,000.

▲ **N. Y., New Hartford**—OFFICE—Utica Mutual Insurance Co., 1st Natl. Bank Bldg., Utica, plans by Childs & Smith, 20 N. Wacker Dr., Chicago 6, Ill., office bldg. $2,000,000.

N. Y., New York—CHURCH—Broadway Temple-Washington Heights Methodist Church, 639 W. 173 St., Zone 32, plans by Shreve, Lamb & Harmon Assoc., 11 W. 44 St., Zone 18, church alterations, 4109 Broadway. $500,000.

N. Y., New York—MEMORIAL CHAPEL—Presbyterian Hospital, 168 St. and Fort Washington Ave., Zone 32, plans by Eggers & Higgins, 100 E. 42 St., Zone 17, memorial chapel, 620 W. 168 St. $520,000.

Okla., Oklahoma City—EDUCATIONAL—First Baptist Church, 11 and Robinson Sts., Zone 3, plans by Nottger & Lawrence, 2756 N.W. 23 St., Zone 7, educational bldg. $750,000.

Pa., Phila.—APARTMENT—Bala Realty Co., 132 Garrett Rd., Upper Darby, plans by Charles H. Fulker, 20 Lownes Lane, Springfield, apartment, $400,000.

▲ **Tenn., Nashville**—SHOPPING CENTER—H. W. Creswell & Wm. C. Weaver, Jr., Commerce Union Bank Bldg., plans by Hart, Freeland & Roberts, 3rd Natl. Bank Bldg., modern regional shopping center, Hillsboro Rd. $1,000,000-$2,000,000.

▲ **Tex., Dallas**—OFFICE—United American Insurance Co., 606 N. Field St., plans by George L. Dahl, 2101 N. St. Paul St., 6 story, bsmnt., 50,000 sq. ft. concrete, steel office, concrete pier and beam fdn. $1,000,000.

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Tex., Edna—HOUSING—R. F. Beeler, 3814 Palm St., Houston, frame housing, concrete slab fdn. $550,000.

Ont., Fort Frances—HOSPITAL—La Verendrye Hospital, 110 Victoria Ave., plans by Green, Blankstein Russell & Assoc., 310 Time Bldg., Winnipeg, Man., new wing to have 60 rooms, 3 story full bsmnt., brick hospital addn. $500,000.

▲ **Ont., Hamilton** — SCIENCE — McMaster University, H. W. Frost, secy., plans by W. R. Souter & Assocs., 38 James St. S., science bldg. Approx. $1,000,000.

▲ **Ont., Ottawa**—MEDICAL—University of Ottawa, Laurier Ave. E., plans by J. S. LeDort, 18 Rideau St., medical bldg., Nicholas and Somerset Sts. Approx. $2,000,000.

INDUSTRIAL BUILDINGS

Ariz., Phoenix—FACTORY—Garrett Corp., 9851 Sepulveda Blvd., Los Angeles, Calif., air research factory, $500,000-$1,000,000.

Kan., Kansas City—FREIGHT TERMINAL—Industries Inc., Apco Tower, Oklahoma City, 2, Okla., plans by Thos. F. Holifield, Colcord Bldg., Oklahoma City, Okla., freight terminal bldg. for lease to Yellow Transit Co. $450,000.

▲ **La., Baton Rouge**—PLANT—Ideal Cement Co., Baton Rouge, cement plant, $4,000,000.

▲ **N. J., Cranford**—FACTORY—H. A. Wilson Co., 105 Chestnut St., Newark, small electrical parts mfg. factory on 34 acre tract between Lehigh Valley R.R. and Rahway River. $2,000,000. (Correction—location of project). CD 11/10, under N. J., Crawford.

▲ **N. Y., New York**—WAREHOUSE—Lily Tulip Cup Corp., 122 E. 42 St., Zone 17, plans by Edward J. Hurley, 12 E. 48 St., Zone 17, 1 story warehouse, Bassett Ave. east of Wilkinson Ave. $1,000,000.

Tex., Houston—FREIGHT TERMINAL—Industries, Inc., Apco Tower, Oklahoma City, 2, Okla., plans by Thomas F. Holifield, Colcord Bldg., Oklahoma City, 2, Okla., freight terminal for truck lines, Clinton Rd. $400,000.

▲ **Wash., Tacoma**—PLANT—Hooker Electrochemical Co. Niagara, N. Y., anhydrous ammonia plant, $2,000,000.

▲ **Wis., Milwaukee**—POWER PLANT—Wisconsin Electric Power Co., 231 W. Michigan Ave., Zone 3, plans by Fred A. Luber, c/o owner, power plant, $100,000,000 incl. equip. (10 year plan). CD 1/24/47.

▲ **Philippine Islands, Mindanao** — PLANT — National Power Corp., Manila, basic steel plant to use power generated at the Maria Cristina Falls. $1,000,000.

▲ **Ont., Cornwall**—PLANT EXPANSION—Courtaulds (Canada) Ltd., Cornwall, plant expansion. Approx. $3,000,000.

▲ Ont., Sarnia—PLANT—Godfrey L. Cabot Co., Inc., 77 Franklin St., Boston, Mass., U.S.A., plant. Approx. $1,000,000.

▲ Que., Montreal East—PLANT—Dominion Tar & Chemical Co. Ltd., Sun Life Bldg., Montreal, plant. $5,000,000. W. E. Kenney, c/o owner, engr.

Que., Three Rivers—FACTORY—Apparel-Factors, Ltd., 50 Mount Royal Ave. W., Montreal, factory, Chamberland St. near Canadian Pacific Ry. tracks. Approx. $400,000.

UNCLASSIFIED

Alabama—RURAL DISTRIBUTION LINES—Wiregrass Electric Co-operative, Hartford, 100 mi. electric idstr. line and sys. imprvs., Geneva Co. $410,000.

▲† Calif., Inyokern—RAILROAD—Dpt. Navy, Naval Ordnance Test Station, China Lake (Inyokern) 11 mi. precision railroad to test ordnance at supersonic speeds. $5,000,000.

† Calif., Middletown—OPERATIONAL FACILITIES—U. S. Eng., First and Douglas Sts. N.W., Wash. 25, D. C., operational facilities. $706,000.

† Calif, Norwalk—OPERATING FACILITIES—U. S. Eng., First and Douglas Sts. N.W., Wash. 25, D. C., rehabilitation and provisions addnl. operating facilities. $400,000.

Ill., Aurora—SWIMMING POOLS—City, voted $500,000 bonds Nov. 7, 3 swimming pools. CD 7/27.

Ill., Rantoul—LIGHT SYSTEM—City, voted $400,000 bonds, Nov. 7, electric light system.

▲ Maryland—PARK—State Planning Comn., 100 Equitable Bldg., Baltimore, Zone 2, developing Patapsco Valley Park, $5,000,000.

▲ Md., Baltimore—RECREATION FACILITIES—City voted bonds, recreation facilities, $1,500,000; swimming pools and parks, $500,000; stadium, $2,500,000.

Mich., Battle Creek—PARKING—City, Mayor William V. Bailey, City Hall, concrete, steel 2 level parking structure. $750,000.

Missouri—RURAL DISTRIBUTION LINES—New-Mac Electric Co-operative Inc., Neosho, addnl. rural distr. lines, conversions and sys. imprvs., etc., in Newton, McDonald and adjacent counties. $840,000. Frank Horton & Co., Lamar, consult. engrs. CD 5/27/49.

▲ O., Cleveland—PARK, etc.—City, City Hall, Lakeside and 6 Sts., voted bonds Nov. 7, city park imprvs., $750,000; public auditorium, stadium, $500,000. CD 4/7.

▲ O., Cleveland—PARKING—City, City Hall, Lakeside and 6 Sts., voted bonds Nov. 7, off street parking. $1,000,000.

O., Clyde—ELECTRIC SYSTEM—Village, E. G. Wells, mayor, imprv., expand municipal electric sys., incl. installation 2 dual fuel diesel generating units, each with 250 kwh capacity. $470,000.

† O., Marion—SPRINKLER SYSTEMS—U.S. Eng., First and Douglas Sts. N.W., Wash. 25, D. C., sprinkler systems, Marion Engineering Depot. $503,000.

▲ Oklahoma — RURAL DISTRIBUTION LINES — East Central Electric Co-operative, Okmulgee, 1,093 mi. rural distr. lines, Okmulgee Co. $1,315,000. E. R. Taylor, 4107 E. 11 St., Tulsa, consult. engr. CD 11/10.

▲ Oklahoma — RURAL DISTRIBUTION LINES — Lake Region Electric Co-operative, Wagoner, 1,078 mi. rural distr. lines, Wagoner Co. $1,080,000. E. R. Taylor, 4107 E. 11 St., Tulsa, consult. engr. CD 11/10.

▲ R. I., Providence—PARKING FACILITIES—City, City Hall, voted $1,700,000 bonds, off street parking facilities. CD 2/28.

R. I., Providence—TRAFFIC SIGNAL—City, City Hall, voted $400,000 bonds, traffic signal installations.

▲ B. C., North Vancouver — HARBOR RAIL, etc. — Canadian National Rys., B. Wheelwright, ch. engr., 360 McGill St., Montreal, Que., harbor-rail and industrial development on North shore of Burrard Inlet, $3,000,000.

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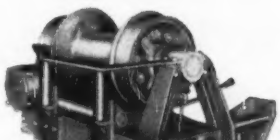

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CONSTRUCTION REPORTS-Second Section

WATER SUPPLY

BIDS ASKED

Pa., Greensburg—B. A. 12/11—Municipal Auth. Westmoreland Co., 230 S. Pennsylvania Ave., Contr. 12, substructures, superstructures, filter equip and piping; Contr. 14, steel tanks; Contr. 15, plumbing; Contr. 16, heating, Contr. 17, electrical work, Contr. 18, outside piping for 10 m. gal. daily filtration plant and high and low service pumping stations, along State Hy. Route 380 where it crosses Beaver Run. Plans deposit $25. Bids 10/23 rejected. CD 11/3, under LB.

Okla., Tulsa—B.A. 12/15—City, c/o Auditor, City Hall, installing 1,900 lin. ft. 72 in. concrete pipe at the Tiawah Tunnel, incl. all connections. $175,000. Plans deposit $20. W. R. Holway, 302 E. 18 St., Zone 14, engr. CD 2/3/48.

W. Va., Fairmont—B.A. 12/15—City, City Bldg., water distr. sys., steel reservoir, 13,900 ft. 16 in. c.i. pipe, Blundon Snyder Small, Keyser, engr. Bids 11/10 rejected. CD 10/10.

Tex., San Angelo—B.A. 12/18—City, Garland P. Franks, mgr., San Angelo, 12 m.g.d. filter plant addn. and raw water pump. station, pumps, motors and starters. $650,000. Plans deposit $25. Freese & Nichols, 407 Danciger Bldg., Fort Worth, Zone 2, engrs. CD 2/2.

LOW BIDDERS

▲ **N. D., Minot**—City, R. E. Barcus, aud., Minot, Nov. 15, water treatment plant, from Rue Contg. Co., Velva, $1,189,500 CD 11/1.

CONTRACTS AWARDED

▲ **Okla, Oklahoma City**—City, City Hall, Zone 2, Contr. 1, Sect. C, water main, to M. A. Swatek & Co., Hightower Bldg., Zone 2, $869,411; Sect. A, to Earl W. Baker & Co., Bethany, $1,445,970. Awarded 11/21. CD 11/17, under LB.

▲ **Pa., Chester**—Municipal Auth., Chester, Contr. 20, reservoir and Contr. 22, water reservoir, to Harry C. Erb, Inc., 1505 Race St., Phila., $299,470 and $94,470 respectively, Contr. 21, water reservoir, to R. M. Luff Constrs. Co., Willow Grove, $1,545,000. Grand total $1,938,940. Bids 11/16. CD 11/22, under LB.

SEWERS, WASTE DISPOSAL

BIDS ASKED

†**S. C., Dupont**—B.A. 12/12—At office Capt W. T. Eckberg, Officer in Charge of Construction, P. O. Box 365, Naval Base, Charleston, sewerage sys. imprvs. at Naval Communication Station, NOY 23613, Spec. 25961, for Yards & Docks Annex, Navy Dpt., Arlington, Va. Plans deposit $10.

Md., St. Michaels—B.A. 12/15—Town Comrs. St. Michaels, 3 pump. stations and sewage treatment plant; mechanical and electrical work for same. Plans deposit $20; 33,000 lin. ft. 8 and 10 in. vitr. clay sewers, 3,700 lin. ft. 8 and 10 c.i. sewers, 9,600 lin. ft. 4-to 10-in. c.i. force mains, effluent sewers. Plans deposit $10. Albright & Friel, Inc., 121 S. Broad St., Phila. 7, Pa., engr. CD 1/24/47.

▲ **Ind., Columbus**—B.A. 12/18—Bd. P. Wks., R. L. Stevenson, chn., City Hall, sewage treatment plant and interceptor sewers, $1,813,270. Plans deposit $25. Jno M. Rotz Eng. Co., 804 Merchants Bank Bldg., Indianapolis, consult. engr. CD 7/13/45.

Minn., Maple Plain—B.A. 12/18—Village, E. L. Conover, clk., sanitary sewers, sewage treatment plant, sewage pump. station, $125,000. Plans deposit $20 treatment plant and station, $15 sanitary sewers. Toltz, King & Day, 1509 Pioneer Bldg., St. Paul, engrs.

LOW BIDDERS

▲ **N. J., Trenton**—Ewing-Lawrence Twps. Sewage Auth., 156 N. State St., rejected bids Oct. 30, sewer pipes, Sect. E, L. B. $695,000; Sect. H, L. B. $596,000; Sect. I, L. B. $954,043. Will re-advertise. CD 10/26, under LB.

▲ **N. J., Trenton**—Ewing-Lawrence Sewage Auth., 156 W. State St., Nov. 27, bldgs. and structures, sewage treatment plant, from Welsbach Corp., 1500 Walnut St., Phila., Pa., Alternates (1), $1,495,972 (2), $1,190,490. CD 11/28, under LB.

S. C., Florence—City, H. M. Thomas, mayor, Florence, Nov. 15, 3 m.g.d. sewage disposal plant, from C. Y. Thomason Co., Greenwood, $484,515. CD 10/17.

CONTRACTS AWARDED

▲ **N. Y., Endwell**—Town Bd. of Town of Union, Town Office Bldg., 3111 Main St., sanitary sewerage sys. for Endwell Sewer Dist., Sect. 1, 4.3 mi. 8-to 24-in. sanitary sewer with appurtenances, Sect. II, approx. 5.7 mi. 8 and 10 in. sanitary sewer with appurtenances, and Sect. IV approx. 6.4 mi. 8-to 16-in. sanitary sewer with appurtenances, to Parlor City Const. Co., 1202 Watson Blvd., Endicott, $961,462; Sect. III, approx. 4.4 mi. 8 in. sanitary sewer with appurtenances and Sect. V, approx. 3.4 mi. 8 in. sanitary sewer with appurtenances to N. R. Corbisello, 6 Ivanhoe Rd., Binghamton, $381,940. Bids 11/8. CD 10/13.

BRIDGES

BIDS ASKED

STATE HIGHWAY LETTINGS

December 13
Louisiana

December 15
Minnesota

December 19
Wisconsin

▲ **Calif., Long Beach**—B.A. 12/19—City Harbor Dpt., 1333 El Embarcadero, 700 ft. span Anaheim St. Bridge 6-12 ft. lanes, $2,000,000. R. R. Shoemaker, harbor engr. CD 12/6/44.

LOW BIDDERS

▲ **Connecticut**—State Hy. Dpt., Hartford, Nov. 20, 4 span 792 ft. steel deck girder bridge over Housatonic River approx. 1,025 lin. ft. grading northerly approach to relocation of Rte. U.S. 6, Newton and Southbury, from Marianni Constr. Co., 2 Forbes Ave., New Haven, $1,629,173. CD 11/6.

▲ **Indiana**—State Hy. Comn., Indianapolis, Nov. 21, 7 span 387 ft. continuous steel beam and rein.-con. girder bridge over Hogan Creek, two 25 ft. lanes, 4 in. center curb, two 5 ft. walks, steel 25 ft. lanes encased concrete piling, Aurora, Dearborn Co., and subway under Pennsylvania Ry. 2 spans, 110 ft. long, two 27 ft. lanes, 15 ft. divider strip, two 6 ft. walks, incl. 0.238 mi. approach grading and 0.057 mi. c. conc., Clarksville, Clark Co., from Robert King, Danville, $522,927, est. $559,576 and $337,559 est. $423,533 respectively***2 span 56 ft. rein.-con. girder bridge exten. over Cedar Creek, 39 ft. roadway 0.098 mi. approach grading and c. conc. 3 span, 70 ft. continuous rein.-con. slab bridge over Matson Ditch, 30 ft. roadway two 2 ft. walks, incl. 0.76 mi. approach grading c. conc. east of Waterloo, DeKalb Co., from Rieth-Riley Constr. Co., Box 477, Goshen, $153,573 est. $155,535***3 span 85 ft. continuous rein.-con. slab bridge over Big Run Creek, 30 ft. roadway, two 2 ft. walks, incl. 0.3421 mi. approach grading and c. conc. 1 span, 16 ft. rein.-con. arch bridge over Arford Drain and 46 ft. roadway incl. 0.265 mi. approach grading and c. conc. east of Butler, DeKalb Co., from Kahl & Mahon, Liberty, $148,750, est. $151,590. CD 11/8.

▲ **New York**—Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany, cancelled bids to have been opened Dec. 13, b. conc. type 2-A, 5 span girder 600 ft. 0.18 mi. Utica Street Bridge over Oswego River, City of Oswego, CHAP. 944, Laws 1946, Oswego Co. $1,077,000. CD 11/17.

STREETS AND ROADS

BIDS ASKED

STATE HIGHWAY LETTINGS

December 12
Maryland

December 13
New York

December 15
Illinois

December 19
Virginia
Wisconsin

December 20
California

December 27
Pennsylvania

N. Y., New York—B.A. 12/15—President Manhattan Boro, Municipal Bldg., Imprv. 42 St., 1 to 2 Aves. and Tudor City Pl., E. 41 to E. 43 Sts., vicinity of United Nations site, grading, curbing, paving, incl. bridge across E. 42 St. at Tudor City Pl., retaining walls, pedestrian stairways, ramps, demolition bldgs., lighting, etc. Plans deposit $50. CD 1/6.

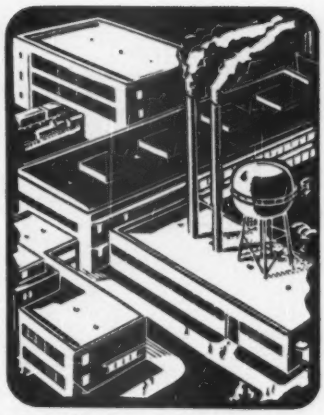
LOW BIDDERS

▲ **California**—State Div. Hys., Los Angeles, Nov. 16, c. conc. on cement treated sub-grade etc. 2 grade separation structures, one pedestrian crossing to provide 6-lane divided freeway 1.1 mi. Santa Ana Freeway between Eastman Ave. and 0.1 mi. west of Atlantic Blvd., Los Angeles Co., from Winston Bros. Co., Monrovia, $1,112,920***plant mix on cement treated surf., constr. 3 rein.-con. slab bridges 7 mi. between 1 mi. north of Temecula and Antelope Rd., Riverside Co., from Griffith Co., 1060 S. Broadway, Los Angeles, $533,704***furnish, place imported base material, applying bit. 94 mi. between 8.8 and 8.2 mi. north of Rte. 26 in Dry Morongo Canyon, Riverside Co., from R. S. Crown, 1923 Rosemead Blvd., El Monte, $617,931. CD 10/23.

CONTRACTS AWARDED

▲ **New Jersey**—New Jersey Turnpike Auth., 65 Prospect St., Trenton, Contr. 60, constr. about 18 mi. 4-lane asph. interchanges and incidental work with N. J. Turnpike, Sect. 2, between Woodbury Heights and Hartford, Gloucester, Camden and Burlington Counties, to Sawin Constr. Co., 10 Village St., East Hartford, Conn., $5,091,044. Bids 11/6, awarded 11/30. CD 11/10, under LB.

▲ **New Jersey**—New Jersey Turnpike Auth., 65 Prospect St., Trenton, Contr. 61, approx. 21 mi. asph. turnpike pavement, two 24 ft. wide roadways with paved shoulders and grass median strip together with pavement of Mt. Holly and Bordentown, interchanges and of drainage, gutters, curbing, topsoiling and incidental work in connection with N. J. Turnpike Sect. 3, Moorestown and Allentown, Mercer and Burlington



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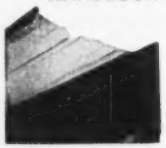

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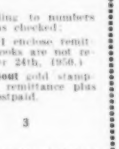

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Counties, to George M. Brewster & Sons, Inc., 275 W. Fort Lee Rd., Bogota, **$5,895,231.** Bids 10/31, awarded 11/30. CD 11/3, under LB.

▲ **New Jersey**—New Jersey Turnpike Auth., 65 Prospect St., Trenton, Contr. 62, constr. asph. pavement for turnpike by- and pavement for 34 cross roads, work appurtenant on Sect. 4 of N. J. Turnpike between Allentown and Raritan River, Mercer and Middlesex Counties, to George M. Brewster & Sons, 275 W. Fort Lee Rd., Bogota, **$7,086,873.** Bids 10/18, awarded 11/30. CD 10/19, under LB.

▲ **New Jersey**—New Jersey Turnpike Auth., 65 Prospect St., Trenton, Contr. 63, asph. paving and shoulders for entire Sect. 5 of N. J. Turnpike 14.2 dual roadway both 4-lane and 6-lane interchange (3) paving, pavement drainage sys., railroad track, grading, removal of overload, topsoiling and reconstr. certain facilities at an adjacent military post, Raritan and Woodbridge Twps., Carteret and Linden, Middlesex and Union Counties, to S. J. Groves & Sons, State Hy. 35, Woodbridge, **$6,296,148.** Bids 11/10, awarded 11/30. CD 11/15, under LB.

▲ **New Jersey**—New Jersey Turnpike Auth., 65 Prospect St., Trenton, Contr. 64, asph. paving and drainage from Morse's Creek on Union Co. to Kearny, Hudson Co., to Gull Contg. Co., 33-151 Lawrence St., Flushing, N. Y., and Tully & Di Napoli, 20-11 12 St., Long Island City, N. Y., **$5,558,791.** Bids 11/17, awarded 11/30. CD 11/21, under LB.

▲ **New Jersey**—New Jersey Turnpike Auth., 65 Prospect St., Trenton, Contr. 65, asph. paving and drainage 7 mi. of Turnpike from Hackensack River in Secaucus to Route 6 in Ridgefield Park, Bergen Co., to George M. Brewster & Sons, 275 W. Fort Lee Rd., Bogota, **$3,289,384.** Bids 10/18, awarded 11/30. CD 10/19, under LB.

EARTHWORK, WATERWAYS

BIDS ASKED

† **Illinois**—B.A. 12/13—U. S. Eng., 80 W. Broadway Louisville, 3. Ky levee embankment, fertilizing and seeding 4 acres, 88 lin. ft. 8 in. corrugated metal pipe, St. Marine Levee Repairs, Jasper Co., CIVENG-15-029-51-66.

Kansas—B.A. 12/13—State, Forestry, Fish & Game Comn., Pratt, Cheyenne Bottoms Outlet Canal, Barton Co., Part I, 417,000 cu. yd. excav., 76,000 cu. yd. embankment, 1,210 cu. yd. grav.; Part II, 805 cu. yd. excav., 458.5 cu. yd. rein.-con., etc. Plans deposit $10. Wilson & Co., 223 N. Santa Fe St., Salina, engrs.

† **Maryland**—B.A. about 12/14—U. S. Eng., 24 St. and Maryland Ave., P. O. Box 1715, Baltimore, Zone 3, maintenance and improv. dredging in Brewerton Sect. and Brewerton-Fort McHenry Angle, Baltimore Harbor and Channels, in Patapsco River leading to Baltimore, 5 statute mi. southeast from Ft. McHenry, CIVENG 18-020-51-5. CD 6/9/44.

† **Arizona**—B.A. 12/14—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo.; furnishing, installing radial gates and gate hoists for Wellton-Mohawk Canal, Station 0.00 to Station 948 plus 29.30 Gila Proj., about 20 mi. east of Yuma, Spec. DC-3241.

† **Maryland**—B.A. 12/14—U. S. Eng., 24 St. and Maryland Ave., P. O. Box 1715, Baltimore, Zone 3, dredging, maintenance and channels, Baltimore Harbor and Patapsco River, CIVENG 18-020-51-5. CD 11/14.

† **New Jersey**—B.A. 12/14—U. S. Eng., 80 Lafayette St., New York 13, N. Y., dredging approx. 100,650 cu. yd. from inshore channel and adjacent bathing areas at Port Newark Terminal, Newark Bay, Serial No. CIVENG-30-075-51-46.

† **Arkansas**—B.A. 12/15—U. S. Eng., 300 Broadway, Little Rock, furnish oil circuit breakers at Bull Shoals dam.

† **Idaho**—B.A. 12/19—Bureau Reclamation, Dpt. Interior, Burley, drilling second block 10 irrigation wells Nos. 34A724, 2A824, 3A824, 3B823, 10A824, 10B824, 11B824, 13A923, 13B624 and 19A825, radial distance of 12 mi. north and northeast of Rupert, Spec. 1002-1112.

† **Oregon**—B.A. 12/19—U. S. Eng., 19 E. Poplar Sts., Walla Walla Wash., fish collection system pumps and motors for McNary Dam, Inv. No. CIVENG 45-164-51-24. Extended date. CD 10/16.

† **Washington**—B.A. About 12/20—U. S. Indian Service Irrigation Div., Bldg. 34 Swan Island, Portland, 18, Oregon; 3 large pump. plants, 2 concrete wasteways, 1 syphon, 4,500 ft. 54 in. concrete discharge pipe for Wapato Proj., five sites all within 6 to 13 mi. of Toppenish.

CONTRACTS AWARDED

Fla., Cocoa—City, dredging barge canal from city and Banana River and Turning Basin to Hill Dredging Co., Cocoa, **$970,200.** Awarded 11/10. CD 1/24/47.

AIRPORTS

BIDS ASKED

Ill., Chicago—TERMINAL—B.A. 12/19—City, City Hall exten. Finger B Terminal bldg., O'Hare Field. Constr. 4. Plans deposit $100. CD 6/11/45.

CONTRACTS AWARDED

▲ † **Alaska**—FACILITIES—U. S. Eng (APO 942, c/o PM, Seattle, Wash.) Anchorage, A.A. C. S. facilities, Elmendorf Air Force Base, Inv. No. S95-507-51-16 to Morrison-Knudsen Co., Inc., 319 Broadway, Boise, Idaho **$1,194,489.** Bids 10/17. CD 10/24, under LB.

AMERICANS ABROAD

India—Government of India, New Delhi, design and construction Bokaro Steam Power Plant in Damodar Valley, to Kuljian Corp., 1200 N. Broad St., Phila., Pa., U. S. A., Approx. **$35,000,000.**

LATIN AMERICA

▲† **Bermuda**—U. S. Eng., 80 Lafayette St., New York 13, N. Y., awarded contract family housing at Kindley Air Force Base, 70 one family masonry dwellings, Eng 30-075-51-110, to Joule Constr. Corp & Viking Constr. Corp., 210 E. 40 St., New York 16, N. Y., **$1,362,562.** Bids 11/2. CD 9/14.

PUBLIC BUILDINGS

BIDS ASKED

▲† **N. J., Trenton**—LABORATORY—B.A. After 11/30—Dpt. Navy, Yards & Docks Annex, Arlington, Va., laboratory (high pressure blower and test wing) NOY 22367. $4,600,000. Frank Grad & Sons, 187 Market St., Newark, archts. CD 11/19/47.

▲ **N. Y., Valley Stream**—HIGH SCHOOL—B.A. 12/11—Bd. Educ., Central School Dist. 1, Valley Stream, Memorial High School. $2,750,000. Plans deposit $50. F. P. Wiedersum, 240 Rockaway Ave., archt. CD 1/4/46.

N. Y., Hicksville—SCHOOL—B.A. 12/11—Bd. Educ., Union Free School Dist. 17, Hicksville, school addn., East St. Plans deposit $26. Knappe & Johnson, 368 E. 149 St., New York, Zone 55, archts CD 9/22.

N. Y., Yonkers—SCHOOL—B.A. 12/11—Bd. Educ., 130 Broadway, school, Rosedale Rd. $450,000. Plans deposit $25. Edward Fleagle, 18 S. Broadway, archt.

Ky., Paducah—HOUSING—B.A. 12/12—City, Municipal Housing Comn., Silas E. Mitchell, exac. dir., brick, concrete housing Proj. Ky. 6-3. Plans deposit $50. G. Tandy Smith & Assoc., 2227 Broadway, archts.

N. J., Newark—HOUSING—B.A. 12/12—Housing Auth. of City, 57 Sussex Ave., Housing Project N. J. 2-11 nine 8 story bldgs., three 3 story bldgs. and community bldg. with boiler plant for 630 families. Plans deposit $100. Kuger & Fava, 11 Hill St., Newark, archts. CD 9/12.

Ont., Toronto—HOUSING—B.A. 12/12—Toronto Housing Auth., H. E. McCallum, mayor, City Hall, Regent Park Housing, north, two 2 H shaped bldgs., Bldg. 12, incl. 54 suites, and Bldg. 15, 48 suites. $500,000. Plans deposit $50. Extended date. J. E. Hoare, Jr., 481 Eglinton Ave. West, archt. CD 10/20.

▲ **N. J., Hackensack**—HOUSING—B.A. 12/13—Housing Auth., 166 Main St., housing, Proj. NJ-28-1, 144 units in 8 bldgs., Newman St. and Railroad Ave. $1,-770,000. CD 11/7/49.

▲ **N. Y., Huntington**—SCHOOL—B.A. 12/13—Bd. Educ., United Free School Dist. 3, Huntington, school, E. Main St. Plans deposit $15. Moore & Hutchins, 215 E. 37 St., New York, Zone 16, archts. CD 5/26.

Ont., North Bay—SUPPLY, BARRACK BLOCK, etc.—B.A. 12/13—Secy., Canadian Commercial Corp., 170 Lyon St., Ottawa, supply bldg. and 180-man barrack blockmess at R.C.A.F. Airport, $600,000. Plans deposit $100.

▲ **La., New Orleans**—HOUSING—B.A. 12/14—New Orleans Housing Auth., 500 California Bldg., 234 housing units, Proj. LA 1-11; 720 housing units, Proj. LA 1-13; 540 housing units, Proj. LA 1-9. Plans deposit $100 each. CD 9/15/49.

Mich., Gaylord—SCHOOL—B.A. 12/14—City, Melvin Freel, secy. Bd. Educ., 2 story, bsmnt., brick, steel, High-Grade School. Bids 10/24 rejected. Louis C. Kingscott & Assoc., Inc., 511 Monroe St., Kalamazoo, archt. CD 10/18.

N. Y., Windsor—SCHOOL—B.A. 12/14—Bd. Educ., Windsor Central School, Windsor, Windsor Central School alterations, addns. $586,439. Plans deposit $25. CD 7/25/47.

▲ **Pa., Johnstown**—HOUSING—B.A. 12/14—Johnstown Housing Auth., 619 Thomas Ave., 2 story, 25x100 ft. brick housing, row-type. $4,900,000. Plans deposit $25. Horace A. Bailey, 305 Bedford St., archt. CD 10/2.

▲ **Pa., Sharon**—HOUSING—B.A. 12/14—Mercer Co. Housing Auth., Mercer, 16 buildings, one community bldg., brick, frame constr. $1,500,000. Clepper & Mallorie, 75 Vine St., archts. Plans deposit $50.

Pa., Uniontown—HOUSING—B.A. 12/14—Fayette County Housing Auth., Uniontown, 2 story, bsmnt. brick federal housing, in Brownsville. $700,000. Altman & Altman, Derrick Ave., archts. CD 9/11.

Tenn., Nashville—HOUSING—B.A. 12/14—Nashville Housing Auth., 701 S. 6 St., 36 buildings, containing 200 dwelling units, etc. Low Rent Housing Project, Tenn. 5-3. Plans deposit $50. CD 2/8/49.

Tex., Bonham—DWELLINGS—B.A. 12/14—Bonham Housing Auth., Bonham, 32 one story buildings, 64 dwelling units 1 mgr. and maintenance unit, concrete slab fdn. $611,000. Plans deposit $25. Smith & Mills, 921 Mercantile Bank Bldg., archts. CD 10/5.

Ala., Huntsville—HOUSING—B.A. About 12/15—Huntsville Housing Auth., c/o Paul W. Hofferbert, archt., Gadsen, 100 housing units, $750,000. CD 4/7.

Mass., Springfield—FIRE ALARM HEADQUARTERS—B.A. 12/15—City, Bd. Fire Comrs., Court St., 2½ story, 50x95 ft., rein.-con., brick, limestone fire alarm head-

quarters Roosevelt Ave. $400,000. Plans deposit $50. Christopher P. Kantianis, 1537 Main St., archt. CD 10/31/46.

Miss., McComb—HOUSING—B.A. 12/15—McComb Housing Auth., c/o archt., 64 housing units, Miss. Proj. 3. Plans deposit $50, Landry & Matthes, 214 W. Pine St., Hattiesburg, archts. CD 1/19.

▲ **N. Y., Baldwinsville**—HIGH SCHOOL—B.A. 12/15—Bd. Educ., Central School Dist., Baldwinsville, Junior-Senior High School, $1,600,000. Extended date. George H. Ketcham, 446 James St., Syracuse, archt. CD 11/21.

▲ **N. J., Long Branch**—HOUSING—B.A. 12/15—Long Branch Housing Auth., Garfield Court, 2 housing projects, 146 units, one consisting 46 units, Ellis Ave. between Central and Sea View Aves., other comprising 100 units on former Norwood Oval tract on east side of Wardell Pl. between High St. and West End Ave., $1,681,000. H. Irving Braun & James Mancuso, 191 and 252 Broadway, archts. CD 10/2.

▲ **Tenn., Jackson** — HOUSING — B.A. 12/15 — Jackson Housing Auth., Jackson, 210 housing units for Whites. $2,170,000. CD 11/28/49.

Wash., Everett—HOUSING—B.A. 12/15—Everett Housing Auth., Community Bldg., 14 and Poplar Sts., 150 dwelling units at Baker Heights addn., Wash. 6-2. Plans deposit $35. H. W. Hall & Assocs., Commercial Bldg., archts. CD 11/2, under LB.

Ont., Prescott—SCHOOL—B.A. 12/15—Public School Bd., C. A. Holmes, inspector, school. Approx. $325,000. J. L. Kingston, 63 Sparks St., Ottawa, archts. CD 9/11.

▲ **Ark., Little Rock**—HOUSING—B.A. 12/16—R. R. Stevenson, chn. Housing Auth., 2800 Battery St., 200 dwelling units. $1,850,000. Plans deposit $50. Wittenberg, Deloney & Davidson, Pyramid Bldg., archts. CD 9/13/49.

Mich., River Rouge—HOUSING—B.A. 12/18—City, Wm. M. Duncan, dir. River Rouge Housing Comn., 1381 Coolidge Hy., brick garden apartments, Proj. Mich. 8-1 and Mich. 8-2. $300,000. Bids 8/29 rejected. Arthur Greig & Assoc., 10538 W. Jefferson Ave., archts. CD 8/14.

Calif., Modesto—HOUSING—B.A. 12/19—Public Housing Auth. of Stanislaus Co., 829 13 St., (1) Proj. Cal-26-1 for 13 duplex bldgs. or 26 dwelling units at Oakdale, $200,000; (2) Proj. Cal-26-2, 15 duplex or 30 dwelling units at Turlock, $230,000; (3) Proj. Cal-26-4, 9 duplex or 18 dwelling units, at Ceres, $140,000. Plans deposit $25 each. Donald Powers Smith, 583 Market St., San Francisco, archt. CD 9/5.

▲ **Calif., Sacramento**—EDUCATION and FINANCE—B.A. 12/19—State Div. Architecture, P. Wks. Bldg., (1) general contract (2) heating, ventilating and air-conditioning (3) plumbing and (4) electrical work (5) elevators 6 story, 159,000 sq. ft., rein.-con. Dpt. Education and Finance Bldg. (pile foundation is already in place) with a machinery and boiler room on 7th floor. $2,630,000. Plans deposit $25. CD 9/12/49.

Tex., Prairie View—DORMITORY—B.A. 12/19—A & M College of Texas Mgr. Physical Plants, College Station, boy's dormitory. Proj. No. 4-36B. $300,000. Plans deposit $45. Norton & Mayfield, Box 1169, Bryan, archts. CD 4/10/47.

Tex., Ranger—HOUSING—B.A. 12/19—Ranger Housing Auth., Ranger, 50 unit masonry housing, concrete slab fdn. $500,000. Plans deposit $25. Bentley, Broad & Nelson, 228 Reserve Loan Life Bldg., Dallas, engrs. and archts. CD 11/13.

Calif., Salinas—SCHOOL—B.A. 12/20—Salinas School Dist., Salinas, 1 story, frame, stucco Washington Junior High School addns. $750,000. Plans deposit $100. F. W. Kellberg, 320 Market St., San Francisco, engr. Chas. E. Buttner, 1112 Pajaro Park Way, archt. CD 11/23/49.

LOW BIDDERS

▲ **Calif., Sacramento**—PUBLIC WORKS—State Div. Architecture, P. Wks. Bldg., Sacramento, Nov. 21, general contract 180,000 sq. ft., rein.-con., steel public works bldg. annex, from Haas & Rothschild, 274 Brannan St., San Francisco, $1,508,000. CD 10/24.

▲ **Calif., San Francisco**—MEDICAL SCIENCES—Bd. Regents University of California, Nov. 22, general contract 13 and partial 14 story rein.-con. structural steel Medical Sciences Bldg., Increment No. 1, from Clinton Constr. Co., 923 Folsom St., San Francisco, $3,634,000***plumbing, from F. W. Spencer & Son, Inc., 149 Gough St., $617,437***heating, ventilating, air-conditioning and refrigeration, from The Scott Co., 243 Minna St., $528,688***electrical work, from Ets. Hoken & Galvan, 551 Mission St., $543,972. CD 10/10.

▲ **Ill., Chicago**—HOUSING—Chicago Housing Auth., 608 S. Dearborn St., Zone 5, rejected bids Sept. 28, 274 housing units at 26 St. and Calumet Ave., L. B. $2,767,000, Est. $2,500,000. New bids Nov. 27, from previous low bidders. CD 10/4, under LB.

▲ **Ill., Chicago**—HOUSING—Chicago Housing Auth., 608 S. Dearborn St., Zone 5, Nov. 21, two 7 story, 74 unit, 30x275 ft. apartments, Archer Ave. and 23 St., from S. N. Nielsen Co., 3059 Augusta Blvd., $1,520,000. CD 10/31.

▲ **Ill., Chicago** — APARTMENT, etc. — Medical Center Comn., 809 S. Ashland St., Zone 12, rejected bids Oct. 10, 10 story, 145 unit brick, rein. con. staff apartment and 9 story residence hall for men. L. B. $2,135,750. CD 10/18, under LB.

▲ **Kan., Lawrence**—MEMORIAL UNION—State Bd. Regents, Topeka, Nov. 14, general contract Memorial Union Bldg. addn., from Basil Green, Lawrence, $940,500; plumbing and heating, from Natkin & Co.,

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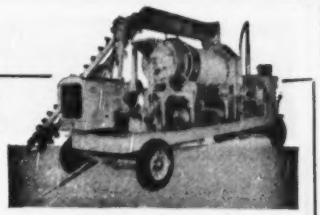

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1924 Oak St., Kansas City, Mo., $368,190. CD 11/9.

▲ **Ky., Louisville**—HOUSING—Louisville Municipal Housing Comm., York St., Zone 2, rejected bids Oct. 3, general contract South Housing Proj. Ky 1-5, L. B. $6,846,000. Bids 9/12 rejected Will re-advertise. CD 10/6, under L.B.

▲ **N. C., Greensboro**—HOUSING—Greensboro Housing Auth., Alonzo C. Hall, chn., Greensboro, Nov. 28, general contract one hundred 1 and 2 story bldgs., 400 living units, from H. L. Coble Constr. Co., Greensboro, $3,169,890. Rejected bids for heating, L. B. $893,773. CD 10/26.

▲ **Tenn., Knoxville** — HOUSING — Knoxville Housing Auth., 1701 Jouroiman Ave., Nov. 22, Western Heights Housing Addn., from Foster & Creighton Co., American Natl. Bank Bldg., Nashville, $3,734,000. CD 11/15.

CONTRACTS AWARDED

▲† **Site Not Selected**—ORE REFINERY—U. S. Atomic Energy Comn., 70 Columbus Ave., New York 23, N. Y., design and engineering of new uranium ore refinery, Phase 1, covers study existing research and development work on uranium refining processes and development of preliminary engineering report; Phase II, work will consist final selection of a process and detailed design and engineering of refinery to The Catalytic Constr. Co., 1528 Walnut St., Phila., Pa. $10,000,000.

▲ **Colo., Pueblo**—SENILE—Colorado State Hospital, Pueblo, general contract 6 story, full bsmnt., 120x322 ft. T-shaped, brick, concrete senile bldg. addn., to Mead & Mount Constr. Co., 240 Railway Exchange Bldg., Denver, $1,222,000. Bids 10/10, awarded 11/12. CD 10/30, under LB.

▲ **Conn., Deep River**—SCHOOL—Regional High School, Regional Bd., Essex, regional high school, Kelsey Hill Rd. and Dist. 5, to Associated Constr. Co., 1010 Wethersfield Ave., Hartford, $1,555,000. Bids 10/26, awarded 11/10. CD 11/1, under LB.

▲ **Mass., Falmouth**—SCHOOL—Town, Town Hall, Junior Senior High School, Chute Estate, to Platt Constr. Co., 99 First St., Cambridge, $1,343,000. Bids 10/18, awarded 11/6. CD 10/25, under LB.

▲ **N. Y., New York**—HOSPITAL—Dpt. P. Wks., Municipal Bldg., Zone 7, general contract tuberculosis hospital, Pelham Parkway south and Eastchester Rd., to Gerace & Castagna, Inc., 155-10 Jamaica Ave., Jamaica, $10,192,490***plumbing, to Joseph F. Egan, 3013 Grand Concourse, Zone 58, $1,441,814***heating and ventilating to Heating Maintenance Corp. of N. Y., 220 E. 138 St., Zone 51, $1,603,455*** electrical work, to E-J Electric Installation Co. and Plymouth Electric Const. Co., Inc., 21 E. 40 St., Zone 17, $1,420,000. Grand total $14,657,759. Bids 10/19. CD 10/24, under LB.

▲ **R. I., Cranston**—SCHOOL—City, City Hall, school, Gladstone St., to Westcott Constr. Co., 42 Weybosset St., Providence, $1,348,533. Bids 11/3 awarded 11/16. CD 11/9, under L. B.

▲† **S. C., Aiken**—PLANT—U. S. Atomic Energy Comn., 1901 Constitution Ave., N. W. Wash. D. C., awarded contract to build and operate plant to produce tritium for H-bombs, to E. I. du Pont de Nemours & Co., du Pont Bldg., Wilmington, Del., Approx. $260,000,000.

▲ **Tex., Amarillo**—HIGH SCHOOL—Amarillo Independent School Dist., Amarillo, Junior High School, to C. S. Lambie & Co., Amarillo Bldg., $1,699,244. Bids 11/14. CD 10/16.

▲ **Ont., North Bay**—HOUSING—Central Mortgage & Housing Corp., 395 Fleet St. W., Toronto, 170 housing units, installing sewers, water mains at R.C.A.F. Station, Tender 1/50, to Sterling Constr. Ltd., 2494 Sandwich St. E., Windsor. Approx. $1,400,000. Bids 11/9. CD 11/1.

COMMERCIAL BUILDINGS

BIDS ASKED

N. C., Cullowhee—DORMITORY—B. A. 12/12—Western Carolina Teachers College, Cullowhee, mens dormitory. Plans deposit $50. Six Associates, Inc., 1025 Hendersonville Rd., Asheville, archt.

Okla., Tulsa—EDUCATIONAL—B.A. 12/12—First Baptist Church, c/o Leory Blackstock, 409 S. Cincinnati St., educational bldg. $625,000. Plans deposit $50. L. B. Senter, Philtower Bldg., archt. CD 4/13.

Ala., Mobile—SCHOOL—B.A. About 12/15—McGill Institute, 252 Government St., boys high school. Approx. $300,000. John J. Carey, 1 National Bank Bldg., archt.

Tenn., Sewanee—GAILOR MEMORIAL HALL—B. A. About 12/15—University of the South, c/o Warren-Knight & Davis, archts Protective Life Bldg., Birmingham, Ala., Gailor Memorial Hall. Approx. $600,000. CD 2/26/47.

Ont., Toronto—HOME FOR AGED—B.A. 12/15—Kaplan & Sprachman, archts., 305 Dundas St. W., 52x252 ft., concrete, steel, home for aged with adjoining T 147x52 ft., 3 story, lounge wing, dining wing, 180 beds, staff accomodations, small synagogue, laboratory dental unit, etc. for Jewish Home for the Aged, Bathurst St., Approx. $900,000. Plans deposit $50.

Ill., River Forest—CHURCH—Bids asked—Grace Evangelical Lutheran Church, River Forest, church, $250,-000. Bertram A. Weber, 221 N. La Salle St., Chicago, Zone 1, archt.

La., New Orleans—OFFICE—Bids asked—Pan-American Southern Corp., 944 St. Charles Ave., converting Bienville Hotel into office, $700,000, Walter W.

Ahlschlager, 212 S. St., Paul St., Dallas, Tex., archt. Aug. Perez & Assoc., Audubon Bldg., assoc. archts. CD 11/14.

SOON LETS CONTRACT

Neb., Omaha—APARTMENT—Omaha Educational Assoc., 927 City Natl. Bank Bldg., soon lets contract, apartment. $750,000. M. J. Lahr, Standard Oil Bldg., archt. CD 6/15.

CONTRACTS AWARDED

▲ **Ga., Albany**—HOUSING—Dpt. Air Force, Pentagon Bldg., Wash., D. C., construct, manage, finance 300 housing units at Turner Air Force Base to Turner City Corp., construction contract, to Byck-Worrell Constr. Co., 318 E. Bay St., Savannah, Est. $2,000,000.

▲ **Ill., Chicago**—APARTMENT—Louis I. Simon, 650 Bittersweet Pl., Zone 13, 124 unit apartment, to Burton Constr. Co., W. Washington St., Zone 2, $1,235,000. Jos. Simon, 179 W. Washington St., Zone 2, archt.

▲ **N. J., Trenton**—APARTMENT DEVELOPMENT—Alstan Inc., Broad St. Bank Bldg., apartment development, Sharps Ave., separate contracts, $1,000,000.

▲ **N. Y., Massapequa**—HOUSES—Midlawn Estates, c/o Alwin Cassens, Jr., archt., 116-55 Queens Blvd., Forest Hills, 230 houses, Hicksville Rd. Owner builds. Approx. $2,000,000.

▲ **N. Y., Plainedge (P.O. Farmingdale)**—HOUSES, etc. —Syndicate, c/o Jerome Wolk, 89-31 161st St., Jamaica, 800 houses and shopping center on 175 acre tract on Seamen's Neck Rd. and Massapequa-Hicksville Rd. Owner builds. Approx. $10,000,000. (Correction—owners address). CD 11/8.

▲ **Pa., Wynnewood**—APARTMENTS—J. W. M. Corp., 200 E. Wynnewood Ave., apartment development, Wynnewood Rd., to Thomas Starrett Co., Inc., 444 Madison Ave., New York, N. Y. $2,500,000. George S. Idell, 117 S. 17 St., Phila., archt.

▲ **O., Columbus**—APARTMENT—Don M. Casto & Assoc., 145 N. High St., Georgian Colonial Design apartment, 35 buildings, each having 4 apartments in Mayfair Dist., east of here. Owner builds. $1,500,000.

▲ **O., Dayton**—SHOPPING and HOUSING CENTER—Jonathan Woodner Co., Third Natl. Bldg., shopping and housing center, east of here in Mad River and Van Burne Tpws., 490 single homes, 900 apartments, commercial shopping center Xenia Pike, with 6 buildings. Owner builds. Approx. $14,000,000.

▲ **Tex., Dallas**—HOTEL—Baker Hotel, Inc., 1400 Commerce St., hotel addn. (exclusive of fdn.) to J. E. Morgan & Sons, 6010 Forest Park Rd., Approx. $1,000,000.

▲ **Tex., Dallas**—OFFICE—Gibraltar Insurance Co. of America, 417 N. Ervay St., 11 story (only) office, to J. W. Bateson Constr. Co., Inc., Irwin-Keasler Bldg., $2,608,800. Bids 10/18, awarded 11/22. CD 10/24, under LB.

▲ **Tex., Dallas**—OFFICE—Republic National Bank, 1515 Main St., 35 story office and bank, to J. W. Bateson Co., Inc., Industrial Blvd. Approx. $16,500,000. Bids 10/17. CD 9/25.

▲ **Va., Arlington**—DEPARTMENT STORE—C. Kann Sons Co., 7 St. and Pennsylvania Ave., N.W., Wash., D. C., 3 story, brick exterior, crab-orchard stone, glass and natural wood dep,rtment store, escalators and elevators, 1,000 car parking space, Fairfax Dr., N. Washington Blvd., Kirkwood and Monroe Sts., to George A. Fuller Co., 597 Madison Ave., New York, N. Y. Approx. $4,000,000. Awarded 11/27. DeYoung, Moscowitz & Rosenberg, 205 E. 42 St., New York, N. Y., archts.

▲ **Va., Richmond** — APARTMENTS — Suburban Apartments, Inc., c/o contractor, 74 one to two story apartments and 5 accessory bldgs., on Staples Mill and Bethlehem Rds., to The Duke Constr. Co., Dartmouth Ave. Approx. $1,404,000.

▲ **Ont., Dundas**—DWELLINGS—Grant Constr. Co. Ltd., 267 E. King St., Hamilton, 180 dwellings. Owner builds. $3,000,000.

▲ **Ont., Oshawa**—DWELLINGS—Cariuso Constr. Co., 47 Gloucester St., Toronto, dwellings, on 73-acre site East of Woodland Ave. Owner builds, $1,000,000. CD 11/14.

INDUSTRIAL BUILDINGS

BIDS ASKED

N. Y., Cold Spring Harbor—LABORATORY—B.A. 12/12 —Carnegie Institute of Washington, Dpt. Genetics, 16 and P Sts., Wash., D. C., laboratory bldgs. $500,000. Anderson & Beckwith, 11 Beacon St., Boston, Mass., archts. CD 9/7.

▲ **Ill., Chicago**—FACTORY—B.A. 12/15—National Video Corp., Kilbourn and Milwaukee Sts., Zone 41, television tubes factory, $1,200,000. Friedman Afschuler & Sincere, 223 W. Jackson St., Zone 6, archts. CD 9/28.

Tex., Fort Worth—LABORATORY—B.A. 12/15—Consolidated-Vultee. Aircraft Corp., Grants Lane, remodel 1 story, 150 x 300 ft. masonry existing hangar bldg. into modern test laboratory. $200,000. M. Messersmith, plant engr. CD 11/16.

▲ **Tex., Snyder**—PLANT—Bids Asked—Lion Oil Co., Snyder, 40 m. cu. ft. capacity natural gasoline plant. $2,750,000. CD 3/15.

SOON LETS CONTRACT

▲ **Ind., Indianapolis**—PLANT, etc.—Chrysler Corp., 341 Massachusetts Ave., Detroit, 31, Mich., soon lets contract 650,000 sq. ft. auto assembly plant and 2 story 50,000 sq. ft. office. $7,000,000. Albert Kahn Assoc. Architects & Engineers, Inc., New Central Bldg., Detroit, Mich., archt. CD 8/14.

CONTRACTS AWARDED

▲ **Fla., Cantonment**—MILL—St. Regis Paper Co., Cantonment, Pensacola, addnl. mill unit, to Merritt-Chapman & Scott Corp., 17 Battery Pl., New York, N. Y., $20,000,000.

▲ **Fla., Jacksonville**—MILL—St. Regis Paper Co., Pensacola, complete kraft pulp and paper mill northeast of here on St. Johns River, to Merritt-Chapman & Scott Corp., 17 Battery Pl., New York, N. Y., $10,000,000. CD 10/25.

▲ **Ga., East Point**—WAREHOUSE—Colonial Stores c/o Robert & Co., Assocs., archts., 96 Poplar St. N.W., Atlanta, 500,000 sq. ft., grocery storage warehouse, to Virginia Eng. Co., Newport News, Va., $3,000,000. Bids 11/10. CD 10/30.

▲ **Ind., East Chicago**—OPEN HEARTH STRUCTURE, etc. —Inland Steel Co., 38 S. Dearborn St., Chicago, Zone 3, Ill., new structure for open hearths, soaking pits, 4 new furnaces, to Arthur G. McKee & Co., 2300 Chester St., Cleveland O., $20,000,000. Frank Carroll, 38 S. Dearborn St., Chicago, 3, Ill., engr. CD 8/10.

▲ **Mich., Highland Park (Br. Detroit)**—WAREHOUSE—Sears Roebuck & Co., W. Arthongton and S. Homan Sts., Chicago, 24, Ill., warehouse, to Darin & Armstrong, 2041 Fenkel St., Detroit. Approx. $3,000,000. J. S. Redden, c/o owner, archt.

▲ **Neb., Omaha**—PLANT—Quaker Oats Co., Merchandise Mart, Chicago 54, Ill., general contract chemical plant, to Parsons Constr. Co., 512 Grain Exchange, $1,000,000. CD 11/9.

▲ **Tex., Beaumont**—PLANT—Texas Gulf Sulphur Co., 1st Federal Saving and Loan Bldg., addnl. construction sulphur mining plant, to Consolidated Western Steel Corp., Orange. Approx. $4,750,000. CD 11/16.

▲ **Tex., Houston**—PLANT—Baroid Sales Div. of National Lead Co., City Natl. Bank Bldg., 2 story, 40,000 sq. ft. plant, incl. 2 wings, Danville St., to H. K. Ferguson Co., M & M Bldg., Approx. $1,000,000. CD 11/29.

▲ **Ont., Sarnia**—PLANT—Dow Chemical Co. of Canada Ltd., 204 Richmond St. W., Toronto, anhydrous ammonia plant, to The Austin Co. Ltd., 16112 Euclid Ave., Cleveland, O., U. S. A., Approx. $1,000,000. CD 4/1/47.

UNCLASSIFIED

BIDS ASKED

▲ **Kan., Lawrence**—FIELD HOUSE, etc.—B.A. After 12/1—State, Bd. Regents, Hubert Brighton, secy., State House, Topeka, fieldhouse and physical educ. armory at Kansas University, $1,750,000, Chas. Marshall, State House, Topeka, state archt. CD 1/6.

† **Ga., Columbus**—FENCE—B.A. 12/17—Dpt. Navy, Charleston Naval Base, Charleston, S. C., security wire fence at Naval Reserve Training Center. NOY 21916, Spec. 24894. Plans deposit $10.

Missouri—RURAL DISTRIBUTION LINES—B.A. 12/18 —Central Electric Power Co-operative, Jefferson City, 54.5 mi. rural d'str. lines, Audrain, Boone, Howard and Randolph Counties, $75,000. Frank Horton & Co., Lamar, engrs. CD 12/1/49.

† **Tenn., Knoxville**—ELECTRIC FACILITIES, etc.—B.A. 12/19—At office Rear Admiral J. F. Jelley, officer in Charge of Construction, P.O. Box 365, Naval Base, Charleston, S. C., remodeling and overhauling electric facilities and installing new equipment at Naval Reserve Training Center, NOY 21913, Spec. 24891, for Yards & Docks Annex, Navy Dpt., Arlington, Va. Plans deposit $10.

† **Tenn., Oak Ridge**—FENCES—B.A. 12/19—U. S. Atomic Energy Comn., P. O. Box E, Attention: R. J. Dunbar, Engineering Div., Oak Ridge, construct perimeter and exclusion fences. Plans deposit $5.

California—TRAFFIC SIGNAL SYSTEMS—B.A. 12/21— State Div. Hys., 120 S. Spring St., Los Angeles, traffic signal sys., Inglewood, Los Angeles Co. G. T. McCoy, Sacramento, state hy. engr.

† **Montana**—TRANSMISSION LINE—B.A. 12/21—Bureau Reclamation, Dpt. Interior, Chester, 82 mi. 115 kilovolt, 3 phase, single-circuit, wood-pole H-frame type transmission line between Canyon Ferry Dam and vicinity of Great Falls, Missouri River Basin Proj., Spec. DC 3248, adv. ENR 12/7. CD 11/27.

† **Canal Zone**—UTILITIES, etc.—B.A. 12/22—At office Engineering and Construction Director, The Panama Canal, Balboa Heights, construction utilities, pavements, and 22 masonry buildings etc. for townsite extension at Diablo Heights. Plans deposit $40.

LOW BIDDERS

▲ **Texas**—GAS GATHERING LINES—Sunray Oil Co. & Associated Operators, Philtower Bldg., Tulsa, Okla., 70 mi. 6-to 24-in. low pressure gas gathering lines and 40 mi. 30 in. low pressure gas gathering lines, in Snyder Area, from Vaughn & Taylor Constr. Co., Philtower Bldg., Tulsa, Okla., $1,415,000 and $1,-210,000 respectively. CD 9/27.

CONTRACTS AWARDED

▲ **Indiana**—GAS PIPELINE—Citizens Gas & Coke Utility, 49 S. Penn St., Indianapolis, 16 mi. 16 in. welded steel gas pipe line from near Zionsville to Indianapolis, mixing station at Prospect St. plant, to United Engineers & Constructors, Inc., West Pt., Phila., Pa., approx $1,500,000.

(Proposal Advertisements see pp. 123 to 125)

OFFICIAL PROPOSALS

appear here each Thursday. Proposal advertisements accepted up to 10 a.m. Friday for the issue dated the following Thursday.

Bids: December 29, 1950 (212)

Sewage Interceptors, Force Mains & Sewage Treatment Plant

MUNICIPAL AUTHORITY OF THE CITY OF SUNBURY

NORTHUMBERLAND COUNTY,

Sealed proposals for the construction of Sewage Interceptors, Force Mains and a Primary Sewage Treatment Plant will be received by The Municipal Authority of the City of Sunbury until 9:00 A.M., December 29, 1950 at which time the bids will be publicly opened and immediately read in a meeting of the Authority to be held at the Municipal Building, 223 Market Street, Sunbury, Pennsylvania.

The work will be divided into two sections and separate proposals will be received for each portion of the project, as follows:

SECTION NO. I—SEWAGE INTERCEPTORS AND FORCE MAINS, consisting of 12", 18", 24" and 27" interceptors, manholes and other appurtenances and 8", 10", and 12" force mains. Pipe and fittings for force mains will be furnished by the Authority.

SECTION NO. II—PRIMARY SEWAGE TREATMENT PLANT, including a control building, separate sludge digestion tanks, primary clarifiers, detritor, pumping station, chlorine contact tank, sludge drying beds, plumbing, heating and electrical work.

Specifications, Proposal Forms, Drawings, and other contract documents may be examined at the office of Ivan M. Glace, Consulting Engineer, Harrisburg, Pennsylvania, or at the Office of the Authority in Sunbury. A complete set of bidding documents, for either section, may be obtained at the office of the Engineer, upon depositing $15.00 for Section I and $25.00 for Section II. This full amount will be refunded if a bid is submitted and if the documents are returned in good condition within 10 days after the opening of bids. If the documents are not returned within this period, the deposit will be forfeited. No deposit will be returned to non-bidders.

No bid on any of the construction work will be considered unless it is accompanied by the bidder's certified check drawn upon a solvent bank and made payable to the order of the Municipal Authority of the City of Sunbury, for the following sums:—

Project	Bid Security
Sewage Interceptors, Force Mains	$7,500.00
Sewage Treatment Plant	15,000.00
Plumbing Work	10% of Base Bid
HeatingWork	10% of Base Bid
Electrical Work	10% of Base Bid

These sums will serve as bid security and will be forfeited to the Authority as liquidated damages in the event an award is made and the contracts and bonds are not promptly and properly executed as required in the specifications.

No bidder may withdraw his bid within 30 days after the actual date of the opening.

The Municipal Authority of the City of Sunbury reserves the right to reject any or all bids, to waive any technical defects, and to accept any bid that it may deem to be for the best interests of the Authority.

BY ORDER OF THE MUNICIPAL AUTHORITY OF THE CITY OF SUNBURY.

(Continued on page 124)

OFFICIAL PROPOSAL

RATE: $1.00 per line (or fraction) per insertion.
CLOSING DATE: 10:00 a.m. Friday for issue out following Thursday.
SEND COPY: Official Proposal Division, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

OFFICIAL PROPOSALS
(Continued from page 123)

Bids: December 29, 1950 (204)

State Road Work

NOTICE TO CONTRACTORS: State DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time on the 29th day of December 1950, by Henry A. Cohen, Director, Bureau of Contracts & Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the Construction of the following project in Oswego County.

Contract No.	Type	Name of highway and miles	Deposit for plans	Bid deposit	Dept. estimate
Chap. 944 Laws 1946	Asphalt Conc. Type 2A 5 Sp. Girder 600' Total	Utica St. Bridge over Oswego River: City of Oswego 0.18 Mile	$15	$66,000	$1,202,631.90

Maps, plans, specifications, and estimates may be obtained at the office of the Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineer, William Robinson, 301 H. Water Street, Syracuse, New York, and may be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for contract is indicated. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement.

Proposal for contract must be submitted in a sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check payable to the order of "State of New York, Commissioner of Taxation & Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders".

The right is reserved to reject any or all bids.

B. D. TALLAMY
Supt. of Public Works

Bids: December 19, 1950 (205)

Repowering & Reconditioning Ferry Boats

Sealed Bids will be received at the Department of Highways, Room 400, Central Highway Office Building, 1221 E. Broad Street, Richmond, Virginia, until 10:00 A.M., Tuesday, December 19, 1950, for the Repowering and Reconditioning Ferry Boats, "NEWPORT NEWS" and "WARWICK".

Plans and specifications are on file at the Richmond and office of Manager at Pine Beach Terminal, Norfolk, Virginia. Proposal guaranty shall be certified check or bid bond in the amount shown in schedule on back of proposal form. Bid Bond to be on form furnished by the Virginia Department of Highways. The Commission reserves the right to reject any or all bids.

Bids: December 14, 1950 (208)

Furnishing and Delivering Cast Iron Pipe

Washington Suburban Sanitary Commission
Sealed Proposal

Sealed proposals for furnishing and delivering two-thousand (2,000) lineal feet of 3-inch and three-thousand (3,000) lineal feet of 4-inch standardized mechanical joint cast iron pipe, Class 150, with joint accessories will be received in the office of the Purchasing Agent, Room 3, of the Washington Suburban Sanitary Commission, Hyattsville, Maryland, until 10:30 A.M. Eastern Standard Time on Thursday, December 14, 1950 at which time and place they will be publicly opened and read.

Specifications may be obtained from W. R. Douglas, Purchasing Agent of the Commission, Hyattsville, Maryland.

Dwight B. Galt, Chairman
Warren Browning
Leland G. Worthington
Commissioners

OFFICIAL PROPOSALS

Bids: December 18, 1950 (211)

Membrane Roofing for Hangar No. 12

THE PORT OF NEW YORK AUTHORITY
NEWARK AIRPORT
CONTRACT NA-29

Sealed proposals for the application of membrane roofing for Hangar No. 12 at Newark Airport will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 8th Ave., New York 11, until 11:30 A.M. Monday, December 18, 1950, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Chief Engineer and copies will be furnished upon deposit of $10. per set. The deposit will be remitted if the documents are returned in good condition, not later than 30 days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman.
New York, December 7, 1950.

Bids: December 18, 1950 (210)

Van Wick Power Supply Replacement of Portions of Feeder V1A

THE PORT OF NEW YORK AUTHORITY
NEW YORK INTERNATIONAL AIRPORT
CONTRACT NYA-152

Sealed proposals for replacement of portions of feeder V1A on the west side of the Van Wyck Approach Road at New York International Airport will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 8th Ave., New York 11, until 11:45 A.M. Monday, December 18, 1950, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Chief Engineer and copies will be furnished upon deposit of $10 per set. The deposit will be remitted if the documents are returned in good condition, not later than 30 days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman.
New York, December 7, 1950

Bids: December 18, 1950 (209)

Furnishing and Delivering Disc Water Meters

Washington Suburban Sanitary Commission
Contract No. 891W

Sealed proposals for furnishing and delivering forty-five hundred (4500) ⅝-inch; one hundred (100) 1-inch; one hundred (100) 1½-inch disc water meters will be received in the office of the Purchasing Agent, Room 3, of the Washington Suburban Sanitary Commission, Hyattsville, Maryland until 10:30 A.M. Eastern Standard Time on Monday, December 18, 1950, at which time and place they will be publicly opened and read.

Specifications may be obtained from W. R. Douglas, Purchasing Agent of the Commission, Hyattsville, Maryland.

Dwight B. Galt, Chairman
Warren Browning
Leland G. Worthington
Commissioners

U. S. Government

Sealed bids will be received in the office of the Engineering and Construction Director, The Panama Canal, Balboa Heights, Canal Zone, until 10:00 A.M. Eastern Standard Time, December 22, 1950, for furnishing all plants, tools, equipment of sites and construction of utilities, pavements, and buildings for Townsite Extension at Diablo Heights, Canal Zone. Twenty-two masonry type buildings are included in this project.

Copies of plans and specifications may be obtained from the Engineering and Construction Director, Balboa Heights, Canal Zone. Requests should be accompanied by a $40.00 deposit for each set, the deposit to be in the form of a United States money order or certified check payable to "Treasurer, The Panama Canal, Balboa Heights, Canal Zone." The plans and specifications may be inspected at the following places:

The Panama Canal, 411 10th St., N. W., Washington 25, D. C.

Office of the Inspector in Charge, The Panama Canal, 804 Customs House, Philadelphia 6, Pa.

Office of the District Engineer, U. S. Engineer's Office, 4735 E. Marginal Way, Seattle 4, Washington.

Office of the District Engineer, U. S. Engineer's Office, 751 S. Figuera St., Los Angeles 55, Calif.

Office of the District Engineer, U. S. Engineer's Office, 909 17th St., Denver 2, Colorado.

Office of the Inspector in Charge, The Panama Canal, Room 1020, 24 State Street, New York 4, N. Y.

Office of the Inspector in Charge, The Panama Canal, Room 863, U. S. Custom House, 610 S. Canal St., Chicago 7, Ill.

Office of the District Engineer, U. S. Engineer's Office, 180 New Montgomery St., San Francisco 19, Calif.

Office of the District Engineer, U. S. Engineer's Office, 1709 Jackson St., Omaha 2, Nebraska.

Office of the District Engineer, U. S. Engineer's Office, Foot of Prytania St., New Orleans, La. (202)

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-3248) will be received by Bureau of Reclamation, Chester, Montana, December 21, 1950, and then publicly opened for furnishing labor and materials and performing all work for the construction of the Canyon Ferry-Great Falls 115-kilovolt transmission line, Missouri River Basin Project, Montana. The work is situated between Canyon Ferry Dam and the vicinity of Great Falls, Montana. The transmission line will be 115-kilovolt, 3-phase, single-circuit, woodpole H-frame type, approximately 82 miles long. Time allowed for completion will be 240 days. For particulars, address Bureau of Reclamation, Great Falls, Montana; or Building 1-A, Denver Federal Center, Denver, Colorado.

MICHAEL W. STRAUS, Commissioner. (206)

Sealed bids will be received in the office of the Engineering and Construction Director, The Panama Canal, Balboa Heights, Canal Zone, until 10:00 A.M., Eastern Standard Time, December 27, 1950, for furnishing all plants, tools, equipment of sites and construction of utilities, pavements, and buildings for Townsite Extension at Margarita, Canal Zone. Sixteen masonry type buildings are included in this project.

Copies of plans and specifications may be obtained from the Engineering and Construction Director, Balboa Heights, Canal Zone. Requests should be accompanied by a $40.00 deposit for each set, the deposit to be in the form of a United States money order or certified check payable to "Treasurer, The Panama Canal, Balboa Heights, Canal Zone." The plans and specifications may be inspected at the following places:

The Panama Canal, 411 10th St., N. W., Washington 25, D. C.

Office of the Inspector in Charge, The Panama Canal, 804 Customs House, Philadelphia 6, Pa.

Office of the District Engineer, U. S. Engineer's Office, 4735 E. Marginal Way, Seattle 4, Washington.

Office of the District Engineer U. S. Engineer's Office, 751 S. Figueroa St., Los Angeles 55, Calif.

Office of the District Engineer, U. S. Engineer's Office, 909 17th St., Denver 2, Colorado.

Office of the Inspector in Charge, The Panama Canal, Room 1020, 24 State Street, New York 4, N. Y.

Office of the Inspector in Charge, The Panama Canal, Room 863, U. S. Customs House, 610 S. Canal St., Chicago 7, Ill.

Office of the District Engineer, U. S. Engineer's Office, 180 New Montgomery St., San Francisco 19, Calif.

Office of the District Engineer, U. S. Engineer's Office, 1709 Jackson St., Omaha 2, Nebraska.

Office of the District Engineer, U. S. Engineer's Office, Foot of Prytania St., New Orleans, La. (207)

(Continued on page 125)

OFFICIAL PROPOSALS
(Continued from page 124)

Bids: December 15, 1950 (197)

Construction of Extensions to Water Distribution System

Sealed Proposals will be received by the City of Fairmont, West Virginia, at the office of the Director of Water, Robert M. Morgan, until 2:00 P.M., December 15, 1950 and there publicly opened and read immediately thereafter for the Construction of Extensions to the Water Distribution System as follows:

Contract No. 1, Section A consists of the installation of approximately 13,980 lineal feet of 16" Cast Iron Pipe and Specials, approximately 13,100 lineal feet of 20" Cast Iron Pipe and Specials, of which approximately 280 lineal feet will be encased in steel casing under Railroad Right-of-Ways, approximately 432 lineal feet of 20" Usiflex Joint Cast Iron Pipe in a crossing of the Monongahela River, setting necessary valves and boxes, connecting above pipe lines to existing pipe lines or structures, construction of two reinforced concrete foundations for 1,000,000 gallon steel reservoirs and construction of a reinforced concrete altitude valve pit.

Contract No. 1, Section B consists of installing approximately 2,350 lineal feet of 16" Cast Iron Pipe and Specials, setting necessary valves and valve boxes and connecting to existing Pipe Lines.

Mechanical Joint Cast Iron Pipe and Specials and Hub end Valves with Boxes will be furnished by the Owner, other material to be furnished by the Contractor, all in accordance with Plans and Specifications on file in the office of the Director of Water, Fairmont, West Virginia and in the office of Blundon, Snyder & Small, Consulting Engineers, Keyser, West Virginia.

Said Plans, Specifications, Proposal and Bond Forms may be obtained at the office of Blundon, Snyder & Small, Consulting Engineers, Keyser, West Virginia, for the sum of Ten ($10.00) Dollars which will not be refunded. Each Proposal must be accompanied by a Certified Check on a solvent Bank or a Bidder's Bond, payable to the Mayor and Council, for at least 5% of the amount bid as a guarantee that the Bidder, if awarded the Contract, will furnish a Surety Bond acceptable to the Mayor and Council and execute the Contract on the prescribed Forms within ten (10) days after notice of the award of the Contract. Certified Checks or Bid Bonds of all but the three lowest Bidders will be returned within ten (10) days after the opening of the bids.

All Proposals must be on Standard Forms furnished by the Consulting Engineers.

Prevailing wage rates must be paid for labor.

The successful Bidder shall furnish a Bond in the amount of the Contract Price, issued by a responsible Surety, approved by the Mayor and Council and drawn to protect the said City. Should the successful Bidder fail to furnish said Bond and execute the Contract within ten (10) days after notice of the acceptance of his Proposal, the 5% Bid Check or Bidder's Bond will be forfeited to the City as liquidated damages.

The Mayor and Council reserve the right to waive irregularities, reject any or all bids and to withhold the final award of the Contract for a period of thirty (30) days after the opening of the bids.

CITY OF FAIRMONT, WEST VIRGINIA
By: Robert M. Morgan,
Director of Water.

Bids: December 11, 1950 (199)

Furnishing and Delivering Cast Iron Mechanical Joint Fittings

WASHINGTON SUBURBAN SANITARY COMMISSION

SEALED PROPOSAL

Sealed proposals for furnishing and delivering three-hundred (300) tons of Standard Mechanical Joint Fittings and accessories will be received in the office of the Purchasing Agent, Room 3, of the Washington Suburban Sanitary Commission, Hamilton Street, Hyattsville, Maryland until 11:00 A. M. Eastern Standard Time on Monday, December 11, 1950 at which time and place they will be publicly opened and read.

Specifications may be obtained from W. R. Douglas, Purchasing Agent of the Commission, Hyattsville, Maryland.

Dwight B. Galt, Chairman
Warren Browning
Leland G. Worthington
Commissioners

OFFICIAL PROPOSALS

Bids: December 13, 1950 (189)

State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, and the Canal Law, and special provisions for projects financed with federal aid funds, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time on December 13, 1950 by Henry A. Cohen, Director, Bureau of Contracts & Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects: Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts & Accounts, Albany, N. Y., and at the office of the District Engineers noted below, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for plans and proposal forms for each contract is indicated below. A refund will be made in full to bidders for the return of one set in good condition within 20 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
		DISTRICT No. 1				
		G. L. Nickerson, Dist. Engr., 333 Broadway, Albany, N. Y.				
Albany	FACT 50-3	Catskill Thruway	(Access) 3.24	Found. Cnc. Rob Grav. =	$108,000	$1,965,000.00
	FACT-C50-4	(Southern Blvd. to Western Avenue)	(Thwy.) 5.06	4.62 mi. Grading = 0.24 mi. Misc. Work = 0.20 mi. (Access Rds. FC Rob Grav. = 3.24 mi.)	Plans $50	
Schenectady	M-98	Movable Dam 4 at Scotia & Movable Dam 5 at Rotterdam, Erie Canal	.....	Replacing Gates at Dam 4 and Replacing Lower Gate at Dam 5	$17,000 Plans $10	$314,901.25
Greene	FAS SH50-12	Phoenicia-Stony Clove, Pt. 4 Project 3937(3)	1.63	Bit. D. S. T. Gravel 42½' Span I-Beam 21' Span Conc. Slab	$12,000 Plans $15	$214,000.00
		DISTRICT No. 2				
		L. Ketchum, Dist. Engr., 109 No. Genesee St., Utica, N. Y.				
Herkimer and Oneida	FAS SH50-9	Prospect-Herkimer Co. Line, Pt. 2 Oneida County Line-Wilmurt Proj. No. S281 (1) and (2)	10.03	Asphalt Concrete, Optional	$55,000 Plans $50	$1,003,000.00
		DISTRICT No. 4				
		A. R. Mulligan, Dist. Engr., Barge Canal Terminal, Rochester, N. Y.				
Monroe	LOSP 50-1P	Lake Ontario State Park (Serv. Rds., etc)		Asp. Conc. Ty. 1A, Opt. =	$67,000	$1,222,000.00
	LOSP 50-2	way, Section A	4.49	7.98 mi.	Plans $50	
			(Pkwy.) 4.82	Cem. Conc. Pavt. = 0.01 mi. (Br.) D.S.T. Grad. Gravel = 1.32 mi.		
Ontario	FAC50-13	Canandaigua City: Main St. FAC49-7 Project U338(6)	1.42	Traffic Signal System	$600 Plans $10	$11,000.00
		DISTRICT No. 8				
		J. S. Bixby, Dist. Engr., Pleasant Valley Road, Poughkeepsie, N. Y.				
Dutchess	FARC50-45	Barrytown-Red Hook-Rock City, S. R. 1312 Proj. F594(3)	1.76	Asphalt Conc. Type 1A, Optional	$18,000 Plans $15	$340,000.00
		DISTRICT No. 10				
		J. J. Darcy, Dist. Engr., Montauk Hwy. at Little E. Neck Road, Babylon, L. I., N. Y.				
Suffolk	NSP50-2	Northern State Parkway Extension	4.05	Furnishing & Planting Trees & Shrubs & Misc. Work	$2,200 Plans $15	$42,000.00
Suffolk and Nassau	NSP50-3 SSP50-3	Northern State Parkway Southern State Parkway	8.71	Chain Link Fence & Misc. Work	$4,500 Plans $15	$81,000.00

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of "State of New York, Commissioner of Taxation & Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the above mentioned Laws, as set forth in "Instructions to Bidders". When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated. The right is reserved to reject any or all bids.

B. D. TALLAMY
Supt. of Public Works

Bids: December 11, 1950 (200)

Furnishing and Delivering Mechanical Joint Cast Iron Pipe (Cement Lined)

WASHINGTON SUBURBAN SANITARY COMMISSION
CONTRACT NO. 889-W

Sealed proposals for furnishing and delivering ten-thousand (10,000) lineal feet of 12-inch; three-thousand (3,000) lineal feet of 16-inch; two-thousand (2,000) lineal feet of 20-inch and one-thousand (1,000) lineal feet of 24-inch Class 150 Mechanical Joint Cast Iron Pipe, Cement Lined, including necessary gaskets, glands, and bolts will be received in the office of the Purchasing Agent, Room 3 of the Washington Suburban Sanitary Commission, Hamilton Street, Hyattsville, Maryland until 10:30 A. M. Monday, December 11, 1950 at which time and place they will be publicly opened and read.

Specifications may be obtained from W. R. Douglas, Purchasing Agent of the Commission, Hyattsville, Maryland.

Dwight B. Galt, Chairman
Warren Browning
Leland G. Worthington
Commissioners

Bids: December 11, 1950 (201)

Furnishing and Delivering Mechanical Joint Cast Iron Pipe

WASHINGTON SUBURBAN SANITARY COMMISSION

CONTRACT NO. 888-W

Sealed proposals for furnishing and delivering forty-thousand (40,000) lineal feet of 6-inch; forty-thousand (40,000) lineal feet of 8-inch and ten-thousand (10,000) lineal feet of 10-inch mechanical joint cast iron water pipe, Class 150, including necessary gaskets, glands and bolts will be received in the office of the Purchasing Agent, Room 3, of the Washington Suburban Sanitary Commission, Hyattsville, Maryland until 10:00 A. M. Eastern Standard Time on Monday, December 11, 1950 at which time and place they will be publicly opened and read.

Specifications may be obtained from W. R. Douglas, Purchasing Agent of the Commission, Hyattsville, Maryland.

Dwight B. Galt, Chairman
Warren Browning
Leland G. Worthington
Commissioners

OFFICIAL PROPOSALS enable you to get the greatest variety of bids —and so to get the lowest prices consistent with the best work.

SEARCHLIGHT SECTION

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (18)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

FLOOD CONTROL Engineer. Prefer engineer with general experience on water and flood projects and Corps of Engineers reports. Must be able to meet the public. Opportunity to affiliate with a progressive agency responsible for developing a sound State water control policy. Salary $4800 per year. P-8209, Engineering News-Record.

MANAGER-OPERATOR for natural gas system. Excellent opportunity for young engineer with gas experience. State age, experience, salary expected and when available. Write P. O. Box 155, Quitman, Miss.

STRUCTURAL ENGINEER experienced in steel and reinforced concrete design, wanted by large, well established Architect-Engineer office located in the Pacific Northwest. Must be capable of assuming design responsibility for commercial and industrial buildings. P-8257, Engineering News-Record.

SALES ENGINEER Wanted—Opportunity for man with construction experience to work into position of Sales Engineer. Experience in general construction desired. Advise age, experience, references, and availability in first letter. Address: R. F. Wilkinson, Economy Forms Corporation, Box 128, Highland Park Station, Des Moines 15, Iowa.

ENGINEERS WANTED for industrial fire prevention field work by national insurance organization with offices in most major cities. These are permanent jobs with a real future, but candidates should appreciate that extensive away from home travel is involved. Age 26-40 preferred. P-8306, Engineering News-Record.

DESIGN ENGINEER to take responsible charge of design of sewers for a Sewerage Collection District. P-8346, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT Wanted. Capable of handling concrete forms, concrete, reinforcing steel, excavation, pipe laying and general supervision of sewerage disposal and water works construction. Give references, enclose photo, reply immediately. R. M. Tauff Construction Co., York and Welsh Roads, Willow Grove, Pa. Phone Willow Grove 2005.

WANTED: DIRECTOR of Public Works and Engineer. Design, Supervision of construction, preparation of plans and specifications covering construction work required by growing City of 20,000 population, stating age, experience and when available and salary desired. Civil Service Board, P. O. Box 1348, Clearwater, Florida.

SANITARY ENGINEER for research and development work pertaining to sewage disposal for small communities. Consulting engineer experience required. One to four years duration. Salary $6000-$8000 depending on qualifications. P-8377, Engineering News-Record.

EXECUTIVE WANTED. Medium sized Mid-Western Crushing and Road Machinery Manufacturer (1,000,000 sales per year) would like to contact executive type man between the ages of 40 and 55 to fill position of top executive. Should have administrative type experience pertaining to foundry, machine shop, welding shop, assembly plant and sales engineering to completely qualify. P-8360, Engineering News-Record.

POSITIONS WANTED

GENERAL SUPERINTENDENT or Superintendent, age 46, married, West Pointer, 25 years experience in complete charge all type heavy construction. Supervised successfully four earth fill dams, two concrete dams, bridges, large sewers, tunnels, foundations, waterworks, flood control, two foreign projects. Superb record and reference. PW-8325, Engineering News-Record.

SALES Estimator, engineer 15 yrs. experience building, heavy const. & paving desires salaried sales position. PW-8180, Engineering News-Record.

ESTIMATOR SEEKS change. Present employment exceeds ten years. Experienced in estimating all types of construction—Billing material—Detailing and Layout. Prefer connection with construction company specializing in water and sewage plant and related construction. PW-8236, Engineering News-Record.

CIVIL ENGINEER—3 years field and office engineering with contractor. Age 26, married. Desire permanent employment with engineering or construction firm. PW-8381, Engineering News-Record.

SEARCHLIGHT SECTION

(Classified Advertising)

EMPLOYMENT: "OPPORTUNITIES" :EQUIPMENT
BUSINESS: :USED OR RESALE

ENGINEERS

ELECTRICAL - MECHANICAL - STRUCTURAL

Openings in Ohio offices offering long term employment with good salary for qualified Group Leaders, Designers and Draftsmen experienced in one or more of the following phases of industrial plant design:

Electrical — **Power, lighting layouts and electrical controls.**

Mechanical — **Plant layout, process piping, conveyors, heating and ventilation, boiler houses, process equipment layout, refrigeration, plumbing, tanks and vessels, packaging equipment, special machinery and equipment.**

Structural — **Structural steel and reinforced concrete.**

Please submit complete resume stating experience, education, salary required and availability date.

THE H. K. FERGUSON COMPANY
Engineers and Builders

The Ferguson Building, 1783 East 11th Street — **Cleveland 14, Ohio**

ASSISTANT CHIEF DESIGN ENGINEER

Capable supervising fundamental design Industrial and Public Utility Power Plant; able to estimate and do early design for proposals.

CHIEF DRAFTSMAN

To supervise production large drafting and engineering force engaged in structural, concrete, piping, electrical and mechanical work; prior Industrial or Public Utility Power Plant experience desirable.

Can consider only candidates under 50 years of age. Both are permanent positions, with good salary for right men. All replies confidential. Submit complete experience resume to:

SALARY PERSONNEL MANAGER

DRAVO CORPORATION

NEVILLE ISLAND — **PITTSBURGH 25, PENNSYLVANIA**

SALARIED POSITIONS $3,500—$35,000

If you are considering a new connection communicate with the undersigned. We offer the original personal employment service (40 years recognized standing and reputation). The procedure, of highest ethical standards, is individualized to your personal requirements and develops overtures without initiative on your part. Your identity covered and present position protected. Send only name and address for details.

R. W. BIXBY, Inc., 272 Ellicott Bldg., Buffalo 2, N.Y.

POSITIONS WANTED

PLANNING-CONSTRUCTION Engineer thoroughly experienced directing detailed site planning, preparation of engineering construction plans, specifications, handling field engineering, supervising all engineering construction on large housing developments, building projects, grading projects, related work. 15 years experience. Age 39. Now working. Available within 30 days subject to location. PW-8348, Engineering News-Record.

EXECUTIVE ENGINEER—to manage, estimating, negotiating, bidding, subcontracting, scheduling, purchase and rental of equipment and materials. Experienced both building and heavy construction. PW-8181, Engineering News-Record.

CONSTRUCTION ENGINEER and Superintendent desires steady employment with Cleveland concern. Qualified in or on light and heavy construction. PW-8361, Engineering News-Record.

PROJECT MANAGER, General Superintendent available to progressive General Contractor. 25 years experience in all types of light and heavy construction. Complete knowledge of all field work and office detail. Have had seven jobs in construction at one time. Ready to assume complete charge of one or more projects. Experienced skeleton crew also available. PW-8366, Engineering News-Record.

(Continued on page 128)

WANTED AT ONCE

CIVIL ENGINEER

For municipal engineering department

Please contact:
CITY ENGINEER
Petaluma, Calif.

CONSTRUCTION SUPT.

wanted by large company. Technical graduate, experienced in building and equipment installation. Chemical plant experience preferred. Man must be free to travel U. S. Give age, education, detailed experience, and salary expected.

Write Box EN 923
221 W. 41 St., N. Y. 18

DRAFTSMEN
STRUCTURAL STEEL

DETAILERS AND CHECKERS
WITH EXPERIENCE
CHAS. E. HESS
Triangle Bldg. — **Pittsburgh 22, Pa.**

FIRST CLASS FOREMAN WANTED

For large concrete sewers and steel sheet piling work in southern N. J. State experience, salary and availability

P-8391, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

ENGINEERS

Major oil company operating in the Middle East requires graduate engineers in numerous classifications, including:

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ASST. MECHANICAL
ELECTRICAL
COMMUNICATIONS
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Positions cover various fields of specialization in the above classifications. Vacancies are for both experienced and inexperienced men. If interested write giving complete outline of experience, education and personal history.

P-8342, Engineering News-Record
330 W. 42nd St., New York 18, N. Y.

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We anticipate increasing our engineering organization during the next several months for the design of Oil Refinery, Blast Furnace, Open Hearth, Steel Mill and Power Plants.

These men should be qualified as draftsmen, designers, checkers or higher engineering skills on design of piping, instrumentation, pressure vessels, structural steel, concrete, platework, heavy mechanical equipment and electrical.

If you are interested and have engineering design experience on this class of work, write to us for a personnel form for prompt consideration of your qualifications.

This work is in our Cleveland office, and is on a 5-day, 45-hour week basis, with time and one-half over 40 hrs; also, vacation and holiday pay. Steady employment and a good opportunity with a good organization.

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CLEVELAND 1, OHIO

Graduate ENGINEERS

GOOD OPPORTUNITIES

for

MAINTENANCE ENGINEERS: Five to ten years' in planning maintenance work, establishing manpower and material requirements, scheduling and controlling work. Must be thoroughly familiar with Machine and Hand Tools used in Plant Maintenance Work. Must have supervised persons doing maintenance work. Must be graduate. For consultation work.

HEATING AND VENTILATION ENGINEERS: Eight to ten years' progressively difficult experience in field and office problems in heating, ventilating and air-conditioning design. Also, experience in making economical evaluation of alternate methods. Must be graduate.

PROCESS ENGINEERS: Must have at least eight years' industrial plant design and experience with at least three years in responsible charge of design work. Plant experience desirable. Must have experience in chemical plant design calculations, equipment design and plant arrangement, with knowledge of structural, power, instrumentation design, etc. Must be graduate.

Give experience, education, age, references, personal history, salary received and salary expected. Please be complete and specific.

All inquiries will be considered promptly and kept confidential.

E. I. du Pont de Nemours & Co.
(Inc.)
Engineering Department Personnel
WILMINGTON 98, DELAWARE

CITY OF DETROIT
Engineers experienced in the design and construction of water works needed for $38,000,000 project. Starting salary $4,223; $4,965; $5,736; $6,586 per year with annual increases. Submit resume of experience with application request.
Detroit Civil Service Commission
1504 Water Board Building
735 Randolph Street, Detroit 26, Michigan

Engineers Wanted
Civil—Electrical—Mechanical—Structural
Apply **KAISER ENGINEERS**
Division of Kaiser Industries, Inc.
1924 Broadway Oakland, California

Well known building concern, New York location, seeks services of experienced men:

(1) **To head up Purchasing and Expediting Department.** Background must definitely indicate strong experience in estimating, purchasing, expediting, general supervision and administrative ability.

(2) **Estimator** for industrial Building Construction.

Reply in confidence giving full details of background, earning capacity of last five years. Enclose snapshots.

P-8321, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

DESIGNER-DRAFTSMAN
WANTED

by long established Engineering firm for work in North Carolina office specializing in Public Works Projects including Steam-Electric Power Plants, Water Purification Plants, Sewage Treatment Plants and other Public Works Projects:

(a) One (1) Architectural Engineer capable of design, layout and production of working plans and specifications and assuming, in addition, supervision of designing and drafting personnel.
(b) Two (2) Designer-Draftsmen for Steam-Electric Power Plant design and preparation of working plans for general and detailed layout including structures, equipment and piping.
(c) Two (2) as per (b) except for work on Water and Sewage Treatment Plants.
(d) Two (2) Draftsmen capable of rapid preparation of completed working drawings from designs by others. Draftsmanship and lettering must be neat and accurate.

Salary open. Furnish complete experience data, samples of workmanship, recent photograph, references, earliest date could report for work, with reply. Only maturely experienced men wanted.

P-8345, Engineering News-Record
330 W. 42nd St., New York 18, N. Y.

FIRST CLASS SUPERINTENDENT
WANTED
For large concrete sewers, flood control and bridge contracts for work in Philadelphia and New Jersey. State salary, experience and availability

P-8284, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

CONSTRUCTION SUPERINTENDENT
Well known building concern, New York location, seeks services of experienced construction superintendent in New York and New Jersey Area. Opportunity for advancement to General Superintendent. Reply in confidence giving full details of background, earning capacity of last five years. Enclose snapshot.

P-8322, Engineering News-Record
330 W. 42nd St., New York 18, N. Y.

ASSISTANT MANAGER OF CONSTRUCTION
Wanted by national organization. A graduate engineer, experienced in all phases of chemical plant engineering and construction, and who has no objection to traveling. Give age, education, detailed experience, and salary expected.
Box ENR 926, 221 W. 41 St., N. Y. 18

STRUCTURAL STEEL DESIGNER AND ESTIMATOR
Wanted by leading central west fabricator. Permanent position and good opportunity with large well established and growing company. Please state qualifications, past experience and salary requirements.

P-8258, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

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STRUCTURAL ENGINEERING

Fortieth Year

OUR COURSES HAVE HELPED THOUSANDS
to better positions and to pass State Board Examinations

- Complete Structural Engineering Course.
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- Architectural Engineering.
- Special Course C (State Board Exams).
- Reinforced Concrete Engineering.
- Structural Steel Designing.

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This estimating system is based on forty years of actual construction experience. It has been sold all over the world for more than twenty years. Thousands of estimators and contractors swear by it. Our offer isn't hot air and big talk. We don't give you a diploma or a lapel button, but we do teach you down to earth estimating which will bring you profitable business.

Just send your name and address today, and we will mail you the complete course at once for your approval.

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2—20-Ton or Larger Truck Cranes

Late Models

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6-33" beams 141 lbs x 53'9"
12-10" beams 49 lbs x 23'6"
72-10" beams 15 lbs x 14'4½"

REICHE & PENNER
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POSITIONS WANTED

(Continued from page 126)

HARD HITTING general construction superintendent not afraid of hard work or long hours. Good organizer. Specializing large housing projects, such as: "Duplexes; houses or 30 story apts. Age 43. PW-8383, Engineering News-Record.

PART TIME WORK WANTED

FOUNDATIONS, BINS, Silos. Flat slabs, continuous structures C.E. 20 years exp. Design & Detail str. steel and reinf. concr. high quality for heavy industr. Bldgs. Homework in N. Y. PTWW-8299, Engineering News-Record.

FREE-LANCE ESTIMATOR — highly skilled, all types construction, all trades. C.E. graduate. Quantity take-offs and pricing. Will call for plans. N. Y. vicinity. LAurelton 5-3393, PTWW-8302, Engineering News-Record.

PH.D. CANDIDATE, Columbia Univ. (Civil Engr.) part time position wanted. Two years general engineering experience. Research preferred. PTWW-8341, Engineering News-Record.

N. J. STATE Licensed Structural Engineer Designer and Detailer available for part time work. 15 years of experience. PTWW-8349, Engineering News-Record.

STRUCTURAL ENGINEER, registered, 26 years experience, desires part time work designing, detailing, checking, etc. PTWW-8391, Engineering News-Record.

THE TAKE-OFF of quantities for any projects and the reinforced concrete design by C.E.—correctly, conscientously, quickly. PTWW-8385, Engineering News-Record.

N. Y. STATE Licensed Structural Engineer, Designer and Detailer available for part time work. 35 years experience. PTWW-7812. Engineering News-Record.

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before U. S. Patent Office. Validity and infringement investigations and opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster, Allwine & Rommell, Registered Patent Attorneys, Suite 454, 815-15th Street, N. W., Washington 5, D. C.

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Any Trade and Type of Project
Literature and Sample on request
Construction Survey Cooperative
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AIR COMPRESSORS
VACUUM PUMPS & STEAM BOOSTERS

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LARGE BIN
For Stone Quarry
1000 tons or more

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FOR SALE OR RENT

2 15T Browning Truck Cranes 1947
4 DW 10s-Scrapers and Tractors 1949
4 D-8 Tractors 1947-1950
1 604 Lima Shovel and Backhoe, late 1948
1 Blaw Knox Cement Bin 200 bbl. 1950
1 Blaw Knox Agremeter Bin 200 ton, 1950
1 General Shovel and Backhoe—1948
1 12 Caterpillar Grader 1950
1 Galion Grader 1950

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Perfect Condition — Immediate Delivery. $5250.00.

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Subject Prior Sale

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(1) Model BV-3 Euclid Loader.
(2) D-8 Caterpillar Tractors with Caterpillar Control Units, 2-U Series.
(2) Allis-Chalmers HD-19 Tractors with Control Units and Push Plates.
(1) Model "W" LeTourneau Scraper.
(2) Car Wood 6-yard 2-wheel Scrapers-New.
(19) Model 43FDT Euclid Bottom Dump Units.
(1) Rex Dual Drum Paver.

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Front End
LOADER

1947, Model HD5G, Excellent Condition

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Koehring Model 604 1½ yd. dragline with Pettibone drag bucket and Erie Clamshell. **D-8 Caterpillar** with KB GA61B dozer.

Both in excellent condition.

Vinson Construction Company
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Phone 4-7296

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Crane-Dragline ¾ yd. Buckeye, new '47, about 1500 hours.
Badger Trencher on cats, used 50 hours.
Can use TD-18A and TD-9 with loader.

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14 Gauge 6" Galvanized

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14x18", 39⅜" gauge track 0-4-0; trackage power 16000/17000 lbs.

ASSOCIATED METALS & MINERALS CORP.
75 West St., New York 6, N. Y.

L.B.SMITH INC.

OFFERS

AIR COMPRESSORS

Gardner-Denver 500 cubic foot two-stage water-cooled, D13000 Caterpillar diesel on four pneumatics. Used two months.

Ingersoll-Rand 105 cubic foot, Waukesha gasoline power, on two rubber tires.

Gardner-Denver air-cooled 105 cubic foot with air receiver, V-belt drive from power take-off and mounted on 1942 Ford chassis with Wood two-yard dump body.

LeRoi 2-stage 105 cubic foot air-cooled, skid mounted, built-in tool boxes, hose reels and hose.

Worthington 210 cubic foot, two-stage, air-cooled, on steel wheels with Hercules diesel.

Pennsylvania 12" x 10" class 3A single cylinder, 355 cubic foot P.D., flat belt driven 50 HP slip ring motor.

Worthington two-stage, water-cooled, vertical 350#, 60 CFM, new condition.

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Cedarapids BBB 1036 Scalper.

10 x 20 Beaumont jaw crusher.

10 x 7 Allis Chalmers Blake type jaw crusher.

Cedarapids No. 1 Kubit.

60 ton 2 compartment storage bin with clam shell gates.

New 16 x 16 double clamshell gates.

20" x 6'6" Belt Type Magnetic Separator.

Conveyors—16"—24"—30"—36".

2—4' x 12' Tyler F800 screens.

Cedarapids portable screening plant.

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1½-ton Ford & Chevrolet.

2½-ton GMC, New and rebuilt.

Sterling COE Model 255GCS tandem drive tractor 9.00x24 tires, 200 HP Cummins supercharged diesel, complete with 40-ton Rogers low bed equipment trailer, 16—7.50x20 tires, airbrakes, outriggers, excellent condition.

2,000 gallon tanks on semi-trailer mounting.

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1½ KW to 125 KW, alternating and direct current, gasoline and diesel powered.

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New JXD Hercules Gasoline.

Buda, Hercules, Hill diesels, rebuilt.

New and rebuilt Murphy diesels.

GM 6 and 12 cylinder diesels, practically new.

SHOVELS—CRANES

Lorain 75B, 1¼ yd. shovel, diesel power.

Lorain 55B gas powered crane.

P&H Model 625A 15-ton crawler crane.

Brownhoist 1-yd. gas shovel and crane.

Lorain 30 combination ½ yd. shovel, hoe & clam.

P&H Model 150 ½ yd. truck crane on 6x4 Mack.

SHOVEL & CRANE ATTACHMENTS

Lorain 75B-77 1½-yd shovel attachment rebuilt.
P&H 203 shovel attachment.
Chain crowd Lorain 30A shovel attachment.
Lorain 40 Hi-Lift shovel attachment.
Bucyrus-Erie 30B tunnel front attachment.
Koehring 301 dragline fairlead.
50' crane-clam boom, 1¼ or 1½-yd.
Lorain 75 fairlead.

Backhoe Buckets & Attachments

¾-yd Lorain, 40, LBS #6105, 44" cutting width, teeth, sheave.

28" outside width solid bottom type LBS #4377, good condition.

¾-yd Amsco 40" cutting width, LBS #9101.

CLAM—DRAG—SCRAPER BUCKETS

NEW TAGLINES

McCaffrey Model 648 for 1¼ to 2-yd crane.
McCaffrey Model 636 for ¾-yd to 1-yd crane.

SHOVEL DIPPERS

Lorain 41, ¾-yd. LBS #7433, rebuilt.

New Lima 1-yd, Amsco, LBS #2295.

Bucyrus-Erie 1¼-yd gas air, LBS #3782, fair.

Lorain 75 manganese 1¼-yd, LBS #7233, teeth and bail.

Lorain 75B, 1¼-yd extended lip, 2¾-yd LBS #2280.

Pettibone-Mulliken 2-yd Lorain 82 or 820, manganese, LBS #5361.

Pettibone-Mulliken 2-yd for 3500 Manitowoc LBS #5783.

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Concrete Finishers

Jaeger type "L" double screed, 10½'-12½', rebuilt.

Heltzel 10'-12' finisher, rebuilt.

Blaw-Knox gas-electric 10½'-12½', rebuilt.

2 Koehring 10'-12', rebuilt.

Concrete Road Forms

830'—Truscon 7"x8" forms, with stakes.

1380'—Heltzel 7"x8" forms, with stakes.

1230'—Heltzel 9"x8" forms with stakes.

1430'—Heltzel 10"x8" forms, with stakes.

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Flynn surgrader 10'-12', rebuilt.

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Form Graders—2 of each

Cleveland formgrader, new condition.

Carr formgrader, new 1944, rebuilt.

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Barber-Greene 44C Trenching Machine 18" to 24" cutting width, 7' depth.

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New Warco D76 tandem driven grader, 12' blade, V-type scarifier, 13.00x24 tires all around, 24,500 lbs., International UD14A diesel engine.

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FD Cletrac crawler tractor, Buckeye bulldozer & double drum power control unit, DHXB Hercules diesel engine. Rebuilt, immediate delivery.

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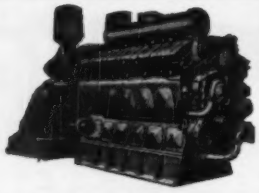

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1875	Fairbanks Morse	33F16	2600	300	375	Enterprise	DSG-6	450	450
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1250	General Motors	16-278A	1600	720	312	General Motors	8-268A	450	1200
937.5	General Motors	12-567	1080	720	312	Clark	MD-4	375	327
625	Alco	6-12¼x13T	750	600	125	General Motors	3-268A	150	1200
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CRANES — SHOVELS — DRAGLINES

7—Diesel & Steam Lorn. Cranes—20, 25, 30 & 40 T.
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96—10,000 Gal. Tank Cars—100 Box Cars.
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Model 160, 190 & 180 & 200 REX Pumpcretes.

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For rent.—cranes, draglines, backhoes and all accessories.

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Browning 15-ton truck crane
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Cat. D4 with T4 Tracavator.
Cat. D4 with 1T4 Tracavator and blade.
A-C HD-19 Garwood cable bulldozer D.D.P.C.U.
Int. TD-18 B-E hyd. bulldozer.
Int. TD-24 with B-E cable blade and P-29 PCU.
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2 Yd 56-S Smith Med T. Tilting Mixer.
2 Yd C.M.C. 56-S Building Mixer.
2 Yd Ransome 56-S Builders Mixer, Elec.
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Jaeger 11-S end disch. concrete mixer on pneumatics.
Rex 11-S end disch. concrete mixers on pneumatics.
Rex 10-S side discharge concrete mixers on pneu.
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Butler complete concrete plant 500 bbls cement large aggregate bin, 5 yd. batcher etc.
Johnson 4 Compt. agg. 2 cement, 4 yd. batcher, 866 bbls. cement silo semi-auto controls, etc.
Butler cement bin 105 bbls. Complete.
Butler 300 Ton, 3 compt. bins, 1 for 400 bbls. cement. 2 compts. for aggregate.

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Barber-Greene 830-840 Hot Mix.
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Rex 5½ yd Adjusta-Hite. New 1949.
Smith Mobile #5 Model 405, rebuilt-guar.
Rex 4 yd TM on Mack 6 BX chassis.
Jaeger 4 yd on Int. HB-12 chassis. Rebuilt.
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Northwest 6, 1½ yd Diesel Crane. Rebuilt condition.
Lorain Model MC-4 Moto-Crane. Condition: Excellent.
Northwest 6, 1½ yd Shovel-Crane, Diesel powered.
Lorain 80, new 1948, 1¾ yd Diesel shovel.
Lima 1201, new 1947, Diesel shovel.
Lima 1201, Dragline, Diesel, 100 ft. boom.
Marion 111, high lift Diesel shovel, new 1948.
Link-Belt K 570 Shovel-Dragline, Diesel. Late type.
Northwest Model 25, ¾ yd Diesel shovel, new 1947.
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Lorain MC 414 Truckcrane 20 tons cap.
Lima 34, Dragline, 1 yd, Cummins Diesel.
Byers 83 Shovel, backhoe, ½ yd new 1947.

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Parsons Model 310. Barber-Greene Model 44C.
Parsons Model 31. Cleveland Model 110.

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1—1½ yd. P&H Model 655-A, dragline and crane, Ser. 6426, powered by Caterpillar Model, DI3000 Diesel engine, Crane boom 75'.
1—1½ yd. Link Belt Model K360, Ser. No. 1959, powered by Caterpillar DI3000 Diesel engine with 65' boom. Also have back hoe attachment boom 25' scoop arm 8'9", pull thrust mast 11'9" with 1½ yd. dipper.
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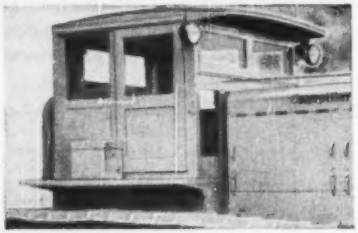

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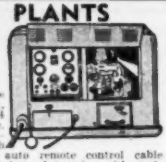

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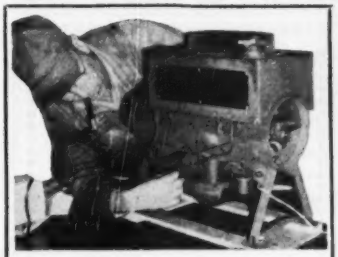

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FS-8314, Engineering News-Record
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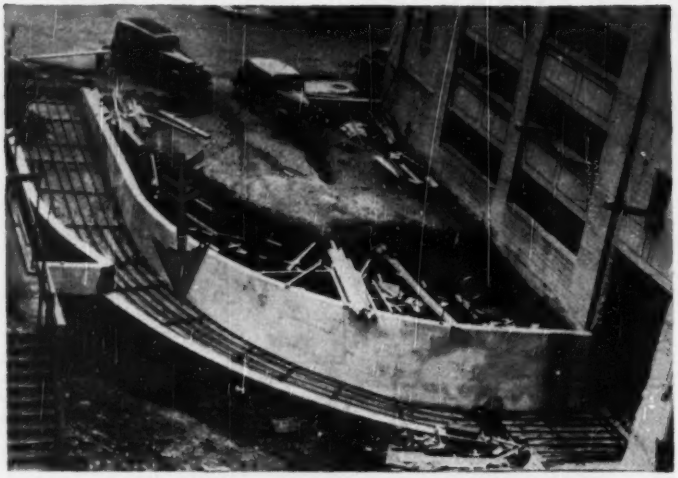
helps to keep this driveway open for traffic *despite* the snow!



The frequent, heavy snows common in the Amsterdam, N.Y. area posed a real problem when the Bigelow-Sanford Carpet Company recently constructed a plant access driveway. This ramp—85-feet long, laid out on a 10% grade, and with a 90° turn—leads from basement to street, and is used by industrial trucks moving materials and finished products between buildings. Any interference with this traffic would delay production and shipping operations, while keeping the drive clear of snow and ice in the usual manner would constitute a major maintenance expense.

The plant engineering staff successfully solved the problem by installing a snow melting system, with a grid of 1¼-inch Byers Wrought Iron pipes connected into 2-inch wrought iron pipe headers. With a water temperature of 130°F, the system is designed to melt 2-inches of snow an hour. Residual water and normal storm drainage are carried away from catch basins located at top and bottom of ramp, through 8-inch wrought iron pipe.

The results obtained have fully justified the judgment of the engineers. In a full winter's operation, with snow depths ranging from 18 to 30-inches, the system worked to perfection. The pavement remained clean and dry without the use of snow shovels or chemicals. Fuel costs are estimated to be low.

In an overwhelming proportion of the successful snow melting systems now installed and operating, designers have used wrought iron pipe for four excellent reasons. The pipe is readily formed and welded. It has a high rate of heat emission. It expands and contracts at practically identical rates with concrete, banning stresses and strains. And its resistance to the corrosive conditions encountered has been conclusively demonstrated in thousands of installations where similar conditions existed.

Our booklet, THE A B C'S OF WROUGHT IRON, explains why wrought iron serves longer and better. Ask for a complimentary copy.

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NEW PRODUCTS

Construction machine features electric wheels

Power-transmission method used results in a machine with no clutch, no transmission, no differential, and individual control of wheels.

CONTRACTORS, military officials, airport operators, and others engaged in moving heavy loads may find an answer to their short-haul problems in the new high-speed electric-wheel Tournatow prime-mover. Conceived on the theory of applying power where it is needed most, the Tournatow has each wheel equipped with a 50-hp electric motor. The prime-mover mounts a diesel engine that drives ac and dc generators used to provide power for all steering and forward, reverse, and lateral movements of the machine. Current is conducted through electric wires to an electric motor and gear arrangement contained in the assembly of each wheel. There are only four moving parts in each wheel—a pinion, two reduction gears, and an internal gear within the wheel.

In operation, the diesel's throttle is advanced to turn generators at required speed, and a potentiometer is then used to regulate flow of current to the wheels. After the diesel is started and speed set, no further use of the engine throttle is required. Steering is by push buttons; forward and reverse movement is accomplished by rotating the controller.

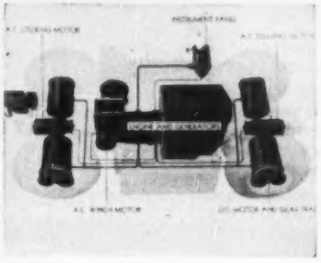
Steering motors are located at front and rear of the unit and are individually controlled by finger-tip switches. Limit switches automatically cut off the steering motors when wheels have reached limit of turn.

By virtue of its combined ac and dc systems, the Tournatow can serve as a standby power unit for welding and other electrical equipment. It carries a 12-cfm air compressor driven by the diesel engine for servicing tires and operating small air-powered equipment. A special cab is available for winter operation, and the unit can carry 5 men in addition to the operator.

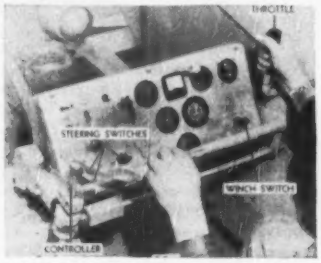
The unit has a low center of gravity and, according to the manufacturer, it develops a high starting torque, a smooth start, and quick and easy stopping. Each of the four driving motors will pull 120 ft/lb stalled or 80 ft/lb at 2,700 rpm. They can be tuned up to 3,600 rpm from a standstill in 1/6 sec, and reverse themselves in ½ sec. In dynamometer tests, when ballasted

(*Continued on page 139*)

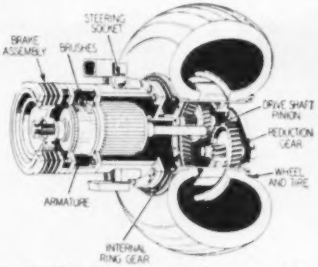
PLASTIC-COVERED WHEEL shows location of Tournatow's electric motor.



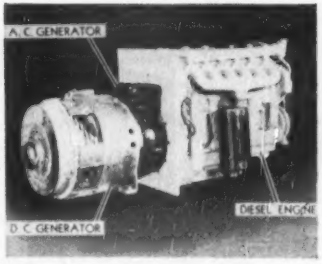
POWER distribution system.



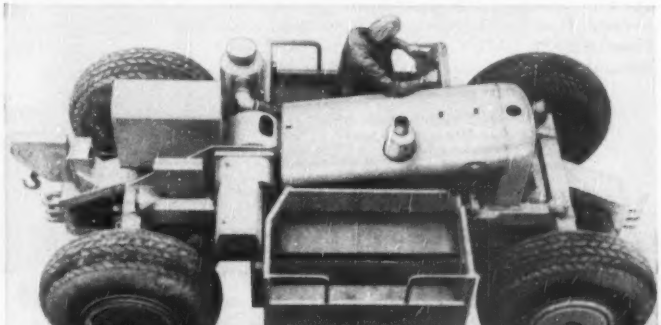
TOURNATOW'S instrument panel.



CUT-AWAY drawing of electric wheel.



HEART of the power system.



TOURNATOW will carry five men in addition to operator. Special cab is available.

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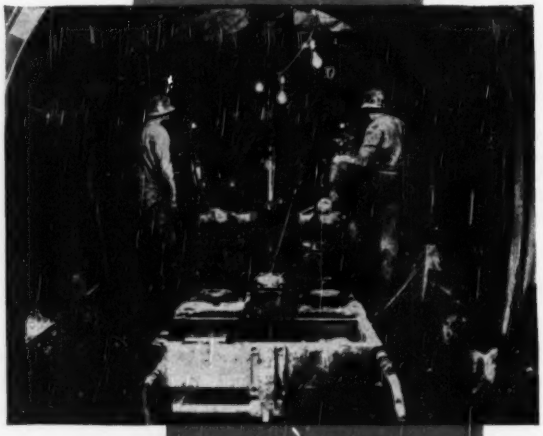
Ready to hook up and go — "packaged" WBJ Compressors require no special foundation — no water piping — no external cooling devices. That's why you get air power "on tap" days ahead of schedule — with a smaller investment in the compressor house. And remember, smooth-running WBJ Compressors — with balanced construction and self-contained cooling system — assure dependable, low-cost air to speed every foot of the bore.

700 cubic foot WBJ Two-Stage Compressors are available with electric motor, diesel or gasoline engine drive.

Complete truck-mounted jumbos are equipped with one, two or three drill booms and a roof jack unit. Separate hydraulic boom and roof jack units are available in various lengths for your custom-built jumbo.

Save drilling time every round — choose versatile Gardner-Denver Hydraulic Drill Jumbos with "*creep-free*" booms. Faster on the setup — faster from hole to hole — faster tearing down. Handle up to 10-foot steel changes — give you low-cost drilling — faster, properly drilled rounds.

For complete information, write Gardner-Denver Company.



GARDNER-DENVER

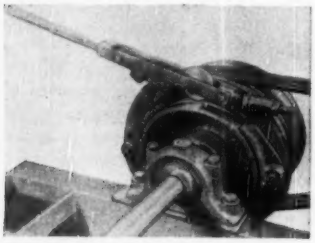
Gardner-Denver Company, Quincy, Illinois
In Canada: Gardner-Denver Company (Canada) Ltd., Toronto, Ontario

with 8,000 lb to provide a total weight of 31,000 lb, the Tournatow developed a 28,200 lb drawbar pull. The unit has 4-wheel coil-spring parking brakes. They operate automatically; becoming set when power goes off, and magnetically releasing when power is applied to the motor.

Specifications include: Engine—GM 6-71 rated 186 maximum brake horsepower at 1,800 rpm; speeds—0 to 25 mph; turning radius—under 14 ft; and winch—30,000 ft lb at 60 fpm. Dimensions are: Length, 17 ft 2 in.; width, 8 ft 6 in.; height, without cab, 5 ft 11 in.; tread, 6 ft 4⅞ in.; wheelbase, 11 ft 4 in.; and weight, 23,000 lb.—R. G. LeTourneau, Inc., Peoria, Ill.

Powder-Actuated Fastener

Dual action has been added as the principal feature of the improved light-duty Ramset fastening tool. Dual action permits a choice of turn or tap operation, depending upon working conditions. Safety features include: Engineering control that makes it impossible to operate at angles greater than 15 deg between the outer edge of the shield and the work surface; larger shields cover 75% more area; and tool is designed so that either a shield or a fixture must be attached before it will operate.—Ramset Fasteners, Inc., 12117 Berea Road, Cleveland 11, Ohio.



Speed Reduction Pulley

Built-in clutch and overload release are features of the Hart speed reduction pulley. Gearing provides reductions from 2½:1 to 100:1. This, in addition to the reduction obtained through V-belt drive from motor to the pulley, permits over-all reductions as high as 400:1. Pulley is available with double clutches to give either low and high speed, or forward and

(Continued on next page)

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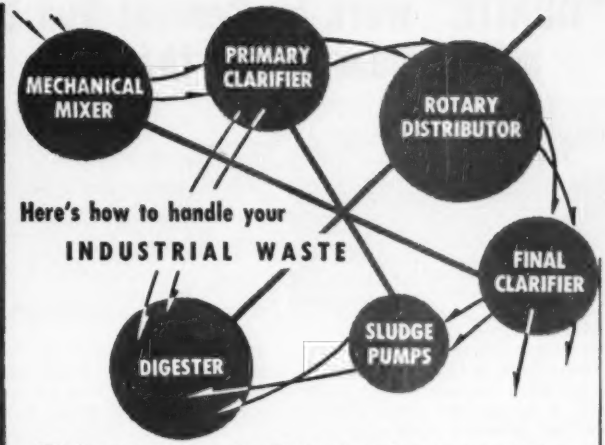

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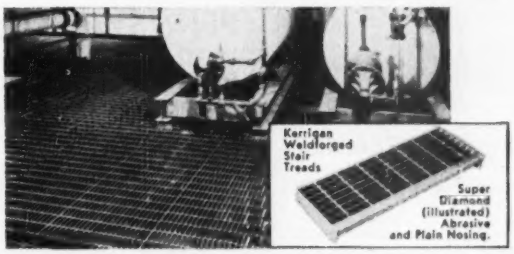

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For safety, strength, maximum light and ventilation, easy installation and maintenance, always specify Kerrigan Weldforged grating and stair treads. Its uses are many, indoors and out—open flooring, stair treads, sidewalk doors, catwalks, subway grating . . . to name only a few.

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Many instances of repair, remodeling and new construction with "Gunite" are described and pictured in Bulletin A2400. A request on your letterhead will bring your free copy by return mail.

CEMENT GUN COMPANY
"GUNITE" CONTRACTORS
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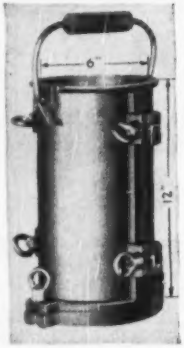

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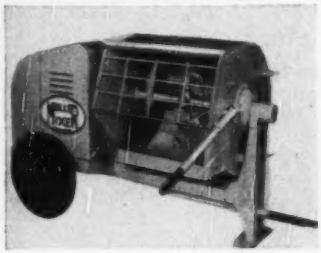
reverse. Production presently consists of models delivery 4,000 and 6,000 in./lb torque.—HART REDUCTION PULLEY CO., 2404 W. CLYBOURNE ST., MILWAUKEE 3, WIS.



Plaster and mortar mixer

Utility-type plaster and mortar mixer has a 6-ft capacity. It features low charging height for convenient loading, and is standard equipped with a bag splitter and a safety grate. Power is provided by a Briggs & Stratton gasoline engine through a roller chain and machine-cut gears. Drive is furnished with or without clutch.—MULLER MACHINERY CO., INC., METUCHEN, N. J.

Drill-mounted level

Adjustable level when mounted on a hand-held electric drill helps the operator to produce a straight hole. The Midget level can be set to drive horizontal or vertical holes, or to drill at any desired angle. It is attached to the drill by two screws, and is easily removed.—SINGER KENNEDY CORP., 21 E. VAN BUREN ST., CHICAGO 5, ILL.

Towed-trailer axle

Self-sprung towed-trailer axle unit is extremely simple in design. It consists of two helical torsion-springs around a forged steel axle member with offset wheel spindles and two bearing brackets for trailer body support. Installation requires four bolts. The axles can be installed singly or in tandem. Design permits use of conventional wheels, hubs, roller bearings, and brakes. The ASF-Linco axles are said to provide an easy ride under all conditions and to permit heavier loads without bottoming. The trailer remains level under unequal loading since an off-center load brings both sides down an equal amount.—AMERICAN STEEL FOUNDRIES, 410 N. MICHIGAN AVE., CHICAGO 11, ILL.

The answer to the nation's need for fast industrial construction!

STRAN STEEL QUONSETS

For FACTORIES • WAREHOUSES • MACHINE SHOPS • STORAGE BUILDINGS

5 Acres of Quonsets

◊ Typical of Quonset's easy adaptation to industrial needs, the National Steel Products Company's new Houston warehouse, completed this July, covers over five acres.

Large industrial structures . . .

TODAY'S urgent construction jobs can be completed *faster* with Quonset buildings.

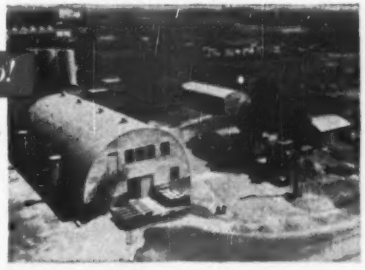
Quonsets give you more than speed. You get maximum economy of material, all-steel fire safety, adaptability, construction ease, and the durability of N-A-X alloy steel.

Today's Quonset is the product of widespread experience gained in use by the Armed Forces in World War II, plus experience acquired by industry, agriculture and commerce in peacetime. Under any circumstances, Quonsets are the best bet in buildings.

Quonset dealers are located all over America. For information, see the one nearest you. Or, write us or phone VInewood 3-8000 in Detroit.

GREAT LAKES STEEL CORPORATION
Stran-Steel Division • Ecorse, Detroit 29, Mich.

. . . and smaller ones, too!

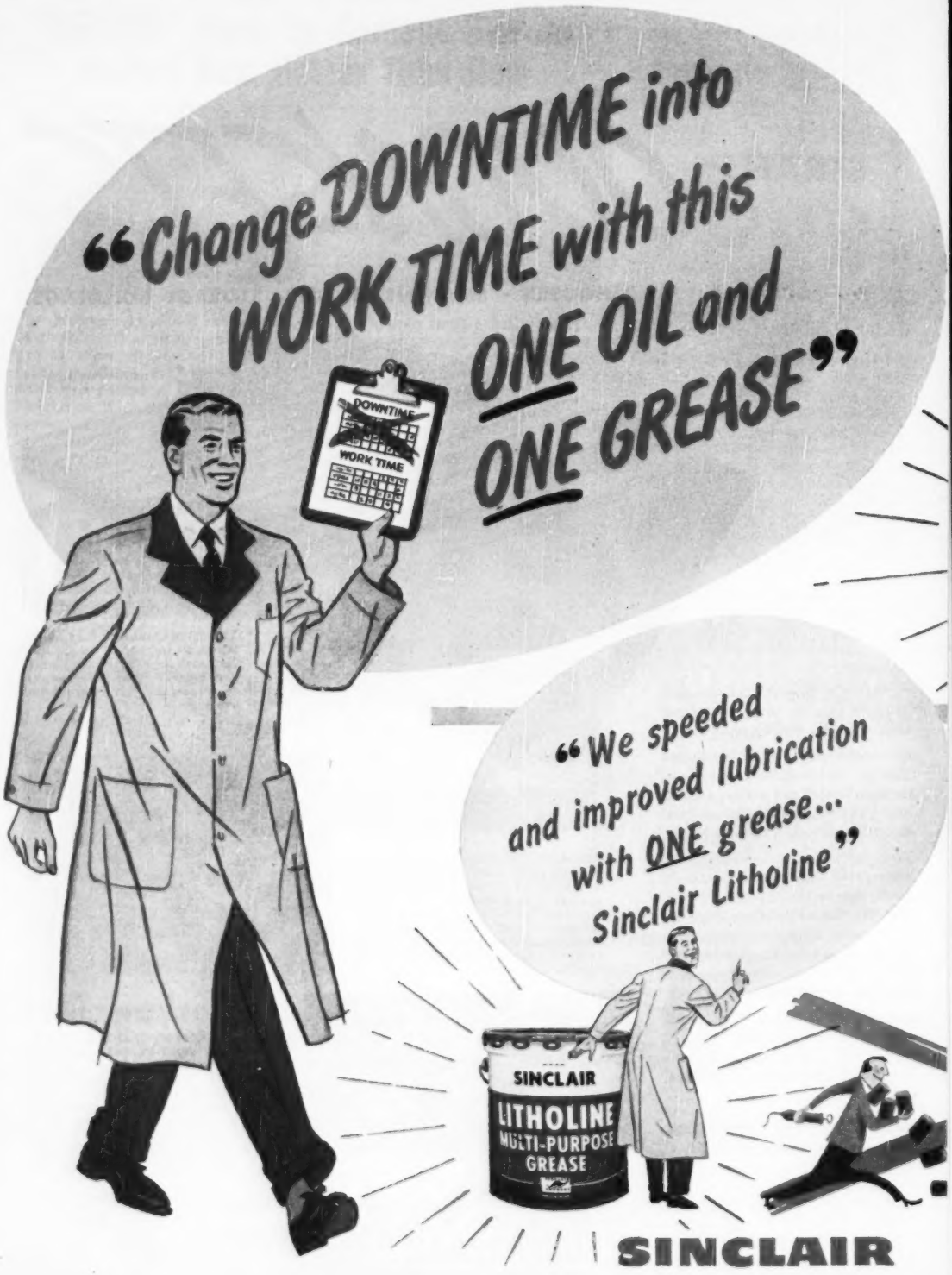


◊ The Arco Company, producer of industrial paint, needed maximum fire safety for its lacquer manufacturing division at Cleveland. It chose Quonset buildings, centering production in the Quonset 40x80 in foreground. Nitrocellulose and other combustibles are stored in nearby smaller Quonsets.

An example of Quonset speed

◊ **88,000 SQUARE FEET OF STORAGE SPACE COMPLETELY BUILT IN ONLY 45 DAYS** —This grain storage depot at Beresford, S.D., was part of last fall's Department of Agriculture program. More than 2,500 Quonsets were erected at 803 different midwestern locations, providing storage space for over 80 million bushels.

NATIONAL STEEL CORPORATION


"Change DOWNTIME into WORK TIME with this ONE OIL and ONE GREASE"
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WORK TIME
"We speeded and improved lubrication with ONE grease... Sinclair Litholine"
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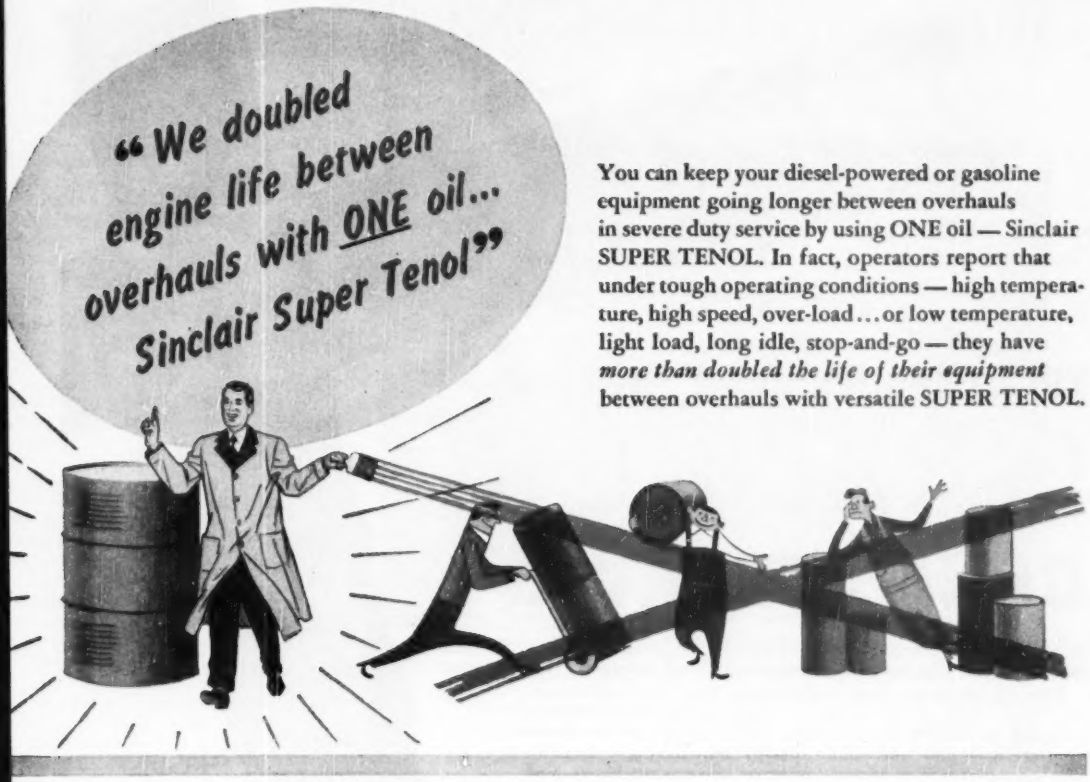


You can keep your diesel-powered or gasoline equipment going longer between overhauls in severe duty service by using ONE oil — Sinclair SUPER TENOL. In fact, operators report that under tough operating conditions — high temperature, high speed, over-load... or low temperature, light load, long idle, stop-and-go — they have *more than doubled the life of their equipment* between overhauls with versatile SUPER TENOL.

Consider how you can cut downtime and grease inventories by using ONE single grease for the complete lubrication job. Sinclair Litholine provides better lubrication than long-established specialized greases. And that means for *all* lubrication points — chassis, wheel bearings, water pumps, universal joints — in winter or summer, under all kinds of operating conditions. Litholine gives you —

1. Superior protective lubrication at *every* point.
2. No danger of costly misapplication.
3. Quicker servicing, less downtime.
4. Smaller grease inventories. One grease instead of from three to four.
5. Fewer dispensing units.
6. Less chance for contamination.
7. Simplified purchasing and distribution.
8. Less wastage.

Sinclair will gladly send you a folder describing demonstrations showing the superiority of Litholine over other greases.

SUPER TENOL AND LITHOLINE

THIS IMPROVED BAR PROVIDES

MAXIMUM BOND STRENGTH

When you use the improved Bethlehem Reinforcing Bar in concrete, you can be sure of maximum bond strength.

This is because the Bethlehem Bar has specially-designed lugs which meet the deformation requirements outlined in ASTM Specification A305-49. These lugs are alternately-sloped and uniformly-spaced. They provide the firm anchorage that means low slips at working loads, and which in turn help prevent the formation of wide tensile cracks in the concrete. Use of the Bethlehem Bar results in better-looking, longer-lasting, more economical structures.

The Bethlehem Reinforcing Bar is made from new-billet steel which meets ASTM Specification A15-39. The bar comes in all sizes from No. 3 (3/8 in. nominal diameter) to No. 11 (1 1/4 in. nominal diameter). Each size is numeral-branded, as indicated in the accompanying illustration, for quick, positive identification. Ask the nearest Bethlehem sales office for a copy of the Bethlehem Reinforcing Bar descriptive sheet. Or write to us at Bethlehem, Pa.

SYSTEM OF MARKING

Bar Size	3/8 Round	1/2 Round	5/8 Round	3/4 Round	7/8 Round	1 Round	1 Sq. Equiv.	1 1/8 Sq. Equiv.	1 1/4 Sq. Equiv.
Number	3	4	5	6	7	8	9	10	11

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

Bethlehem Reinforcing Bars

Manufacturers' Publications

Sewage treatment—Use of Water-Wheel distributor for sewage treatment plants in small communities is discussed in 8-p Bulletin 6554. According to the manufacturer, this method eliminates dosing chamber, siphon, and underground feed pipe, and provides positive, continuous distribution at all flows. Principally, it is designed to apply settled sewage to a trickling filter. The bulletin explains how the Water-Wheel works; contains a line drawing showing its construction; and contains a table listing suggested dimensions for various installations.—YEOMANS BROS. CO., 1445 N. DAYTON ST., CHICAGO 22, ILL.

Bulldozer history—Evolution of the bulldozer to its present state is described in a 4-p folder. The folder describes various significant events in the history of this earth-moving tool; and of the companies that manufacture them. Illustrations show various models dating back to the horse-drawn scrapers.—THE BAKER MFG. CO., SPRINGFIELD, ILL.

Hot-water heating systems—Design data available from Barber-Colman facilitates selection of automatic temperature controls for hot-water heating systems. Data include schematic operation diagram and description, as well as basic wiring information. Bulletin F-3157-1 is composed of several individual data sheets.—BARBER-COLMAN CO., ROCKFORD, ILL.

Coating for concrete—Bulletin covers application of thermosetting coating on concrete for increased corrosion and wear resistance. Brush-on phenol formaldehyde coating (Phenoline) hardens at room temperature. Colors available include brick red, chrome green, iron yellow, gray, and black.—CARBOLINE CO., 7603 FORSYTH BLVD., ST. LOUIS 5, MO.

Remote-control wiring—Non-technical booklet (8 pp) describes remote-control wiring from the consumer's point of view. It is designed as a picture story illustrating various advantages claimed for this wiring method.—GENERAL ELECTRIC CO., CONSTRUCTION MATERIALS DEPT., BRIDGEPORT 2, CONN.

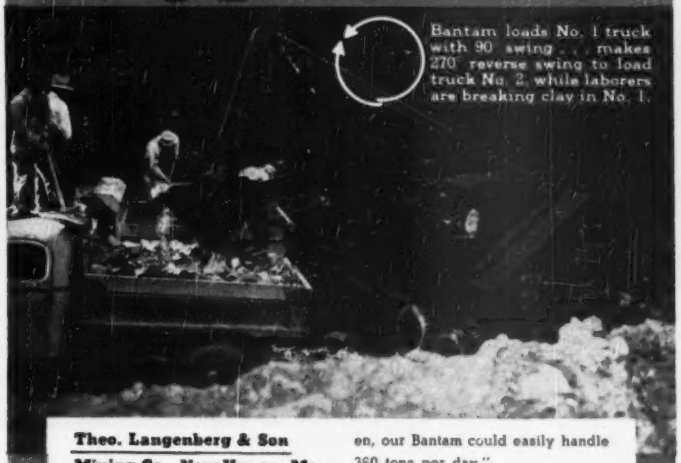
Lightweight pipe—Lockseam Spiral-weld steel pipe, fittings, couplings, and

(*Continued on page 147*)

New BANTAM® METHOD

Boosts output 20%

saves 64 man-hours per day!



Theo. Langenberg & Son Mining Co., New Haven, Mo., cuts costs with Bantam

It used to take *12 men 8 hrs. to load 100 tons* of blasted clay from stockpile to trucks, including time spent breaking clay by hand to 6" size, for making Diesbore cement. Now, *only 4 men and a Schield Bantam shovel load and break 120 tons per 8-hr. day* — 20% more production with 64 man-hours less labor. "What's more," says Langenberg, "if the clay didn't have to be broken, our Bantam could easily handle 360 tons per day."

Mobility Pays Off!

To save transportation costs, Langenberg drove his truck-mounted Bantam 360 miles from factory to New Haven in just 12 hrs. running time. This high speed mobility also enables Langenberg to keep his Bantam busy during slack periods —excavating foundations and working various roadside clay and gravel pits within 40-mile radius. You, too, can get more jobs done at less cost with a mobile Bantam.

Clip . . . Mail today!

SCHIELD BANTAM CO., 201 Park St., Waverly, Iowa SB.C-6

Send details on truck-mounted Bantam { ☐ Shovel ($5900)* ☐ Pile Driver ($5818)* ☐ Dragline ($5665)* ☐ Hoe ($5730)* ☐ Crane ($5265)* ☐ Clamshell ($5790)* }

Name____ Title____

Company____

Address____

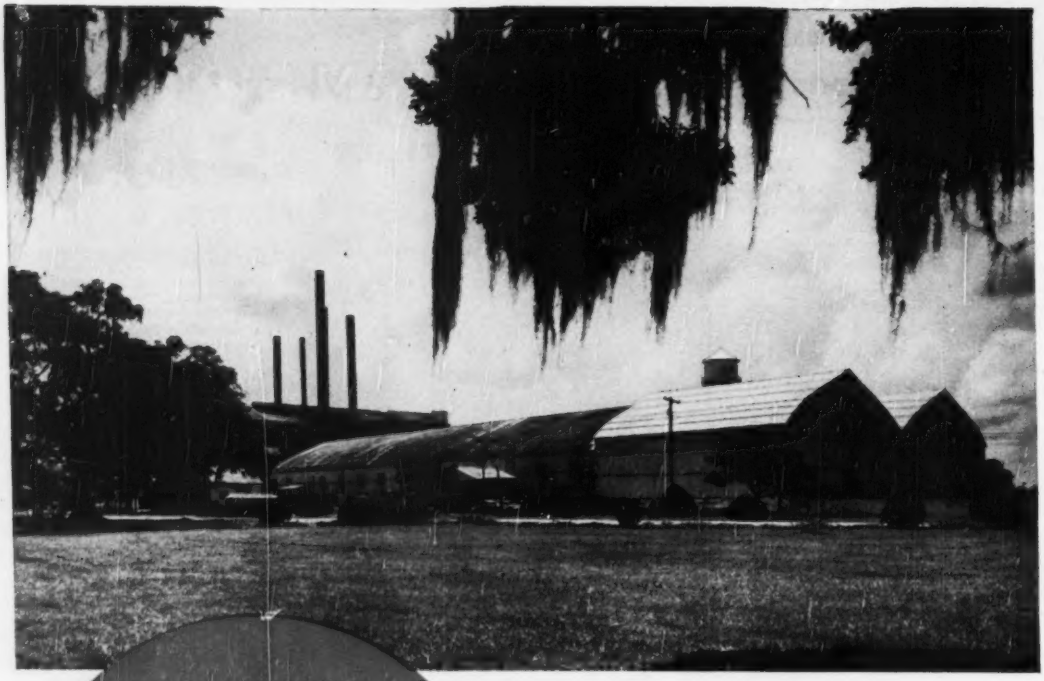
City____ State____

*Less truck, F.O.B. Waverly, Iowa. Prices subject to change without notice.

SCHIELD BANTAM

Costs less . . . travels 35 m. p. h.

GETS MORE JOBS DONE

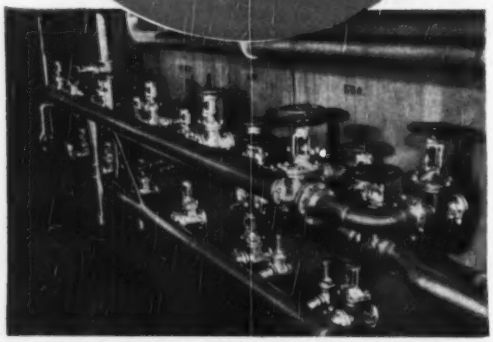


For some of the toughest services in industry —

SUPREME SUGAR REFINERY

equips new plant units with

JENKINS VALVES



These Jenkins Valves installed on pipelines serving the pan floor are a few of the 5200 in use at Supreme Sugar Refinery. In addition, several patterns of Jenkins bronze, iron, and steel valves are used to control steam, water, and other vital lines.

There are few tougher proving grounds for valves than sugar mill service. Sticky, sluggish fluids soon seek out any weak spots in design and construction.

Over 5200 valves are maintained in regular service by the Supreme Sugar Refinery of Tallieu, Louisiana. More installations are continually being made as new plant additions go up. Long ago the management learned that, to insure the lasting efficiency required for profitable operation, the *only really safe economy* is to choose the best valves money can buy. For this reason, they standardized on Jenkins Valves.

In fact, Jenkins Valves have been the consistent choice of leading engineers, architects, and contractors everywhere for more and more of the nation's most notable buildings, wherever cost-wise, future-minded planning is the rule. For plant expansion, as well as new plants—large or small; for the commercial and institutional buildings that dominate today's changing skylines, Jenkins Valves are providing an extra measure of dependability, safety, and low maintenance.

Despite this extra value, *you pay no more* for Jenkins Valves. Let the Jenkins Diamond be your guide to lasting valve economy. Jenkins Bros., 100 Park Avenue, New York 17; Jenkins Bros., Ltd., Montreal.

Sold through leading distributors everywhere

JENKINS VALVES

LOOK FOR THE DIAMOND MARK

TRADE JENKINS MARK

accessories are described in complete detail in Bulletin 507. Major physical properties of Naylor pipe, including collapse pressure, are detailed in specification tables. The folder is designed to present all essential information needed for quick reference.—NAYLOR PIPE CO., 1230 E. 92ND ST., CHICAGO 19, ILL.

Angled pump drives—Right-angle geared pump drives and their applications to vertical turbine pumps is the subject of a comprehensive new bulletin. The bulletin discusses cases where this type of drive is especially desirable, and lists the sizes in which the Gearturbo heads are available. Construction features are described in detail. Sectional drawings contain information on dimensions and other details. Suggested methods of installation are shown in arrangement sketches. — PEERLESS PUMP DIV., FOOD MACHINERY & CHEMICAL CORP., 301 W. AVE. 26, LOS ANGELES 31, CALIF.

Douglas fir lumber—Reference booklet covers properties, characteristics, and grades of Douglas fir; gives recommended grades for interior and exterior uses; and points out many uses for this softwood. "Where to Use Douglas Fir Lumber" is a 16-p 2-color booklet, and is profusely illustrated. —WEST COAST LUMBERMEN'S ASSN., 1410 S. W. MORRISON ST., PORTLAND 5, OREG.

Concrete piles; caissons—Bulletin (8 pp) features a suggested standard specification for cast-in-place concrete piles. The performance type specification is prepared to include all recognized cast-in-palce concrete piles. Described and illustrated are Western's Button Bottom piles which have been driven to depths in excess of 100 ft; pedestal piles, designed for improving the bearing value of soil; composite piles, which are combinations of thin-shell-encased concrete with lower section of wood or concrete-filled pipe; and compressed concrete piles, that require no steel. Western claims to have a special method of driving these piles which prevents separation of the concrete.—WESTERN FOUNDATION CORP., 2 PARK AVE., NEW YORK 16, N. Y.

Asphalt-road heater-planer—Data sheet on asphalt-road heater-planer covers general specifications of the Clark-moore units; describes the fuel-oil burner in detail; describes the blade assembly, frame, and axle; and lists speeds at normal engine turnover with standard-size tires.—ASPHALT MAINTENANCE CO., 41 PARK ROW, NEW YORK 7, N. Y.

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No Trouble with Timber

In spite of the fears—or perhaps because of them—of a couple of generations of experts, there is no apparent shortage in prospect for structural timber, according to Prof. M. W. Jackson of the University of Colorado.

That is a bit of welcome news for the construction industry which has, since 1909, heard from one expert after another that U. S. timber resources were being depleted at a disastrous rate.

• **Unduly pessimistic**—Dates have been set for the exhaustion of nearly every natural resource in the United States.

But forecasters are sometimes unduly pessimistic.

Mark Twain (with a solemn twinkle in his eye) once said that, since the Lower Mississippi River during his time was shortening at the rate of 1¾ miles per year, "in 742 years the Lower Mississippi will be only 1¾ miles long."

Likewise, in the period 1909 to 1918, it was variously estimated that all timber (not just saw timber) was being cut and otherwise destroyed at about four and a half times its rate of increase by growth. Then conservationists made predictions for the future of forest resources that set exhaustion of timber supplies within 20 or 30 years.

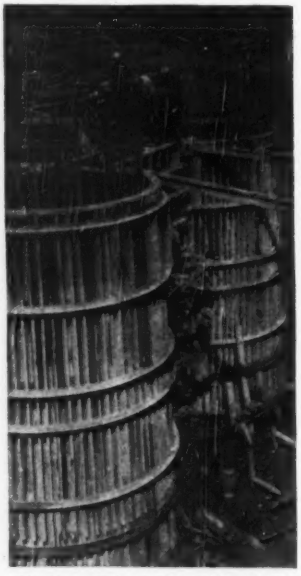
But, in 1945 and 1946 the U. S. Forest Service estimated that there were 1.6 billion board-feet of saw timber standing in the U. S. This figure was a decrease of 14 percent in the amount estimated ten years previously.

In fact, the dire predictions of the early 1900's have not come true because of the natural regrowth of forest lands and better care. In 1944, for example, the rate of drain for all timber was about equal to the rate of growth—even though saw timber was being cut faster than it was being replaced. Douglas fir, for example, is being cut about twice as fast as it is growing.

• **Production up**—The annual production of lumber in the United States at present is between 30 and 40 billion board-feet, of which 75 to 80 percent is softwood (softwood is a term applied to coniferous or cone-bearing trees; hardwood to deciduous trees. The two terms have nothing to do with the hardness of the wood.) Southern pine and Douglas fir constitute about one-third of the softwood production each, with Ponderosa pine third in rank, with one-sixth. Of the hardwoods, oak is the leader, constituting 40 percent of the hardwoods cut.

• **Construction's bite**—Little of the hardwoods and ponderosa pine cut is used in construction work. Over two-thirds of the ponderosa pine, for example, goes into boxing, crating, furniture. The bulk of the lumber used structurally is either Douglas fir or southern pine. Lumber for this use thus constitutes only part of the timber cut—some 55 percent by volume. Of the remainder 18 percent is for fuel and 11 percent for pulp.

• **Saw timber**—Saw timber constitutes about half of the total forest area. It is defined variously in different regions as being trees 9 in. in diameter at breast height for southern pine, 15 in. for Douglas fir, and other diameters for other species. About 20 percent of the forest area is classified as pole timber and the remaining third is classified as poorly stocked, nonrestocking, and seedling and sapling area. Standing timber in the forests is measured on the well-known basis of board footage. Southern pine forests average from 2000 to as much as 10,000 board feet per acre, and merchantable timber will run about 150 to 300 board feet per tree for Southern pine. Stands of Douglas fir in the Pacific Northwest will average 30,000 to 100,000 board feet to the acre.



TIMBER FOR CONSTRUCTION—There will be enough for concrete forms and other building purposes in spite of dire predictions of experts.

Of the total forest resources of the U. S. (about 720,000 sq mi in area), farmers and small owners hold about one-third. And of these total forest resources of saw timber, one-quarter consists of Douglas fir, one-eighth each of Southern pine and Ponderosa pine, and all others in lesser amounts.

• **No difference**—The terms "virgin growth" and "second growth" have no significance in the structural strength of wood. Lumber cannot be positively identified as belonging to one class or the other. Actually, the rate of growth and the quantity of the wood depend on conditions in individual stands of timber and the conditions are highly variable. Thus the term "virgin growth" is an unreliable guide to quality.

But proper management is a requirement for lumber. That would include fire protection, care of growing trees, selective cutting, even pruning. Completely clear lumber free of knots can be obtained, for example, if trees are pruned.

• **Lumber use drops**—The use of wood has gradually decreased with the development of other materials during the past 50 years, another reason that the forests have been able to hold their own.

Replacement of wood by other materials is reflected in the per capita consumption: in the middle of the 19th century the per capita consumption of lumber was about 300 board feet annually. This increased until about 1905 when a peak of 500 was reached. Today this is reduced to about 225.

Since the first colonists landed in the U. S., it has been estimated that over twice as much timber has been cut as was growing at that time. Yet today there are still abundant forest resources that can be maintained with reasonable management.

"We don't dig footage, we dig miles!"

Yes . . . George McDonnell, operator, says that's what they do at Levittown Housing Development with the MICHIGAN ½ yd. Truck Excavator owned by Levitt & Sons, Inc.

"We move all over the field with it," states McDonnell, "and run back and forth to Roslyn, about thirteen miles in only an hour. The MICHIGAN is easy to operate, too — after all, you have air to do the work."

And when it comes to service, Construction Equipment Corp., Long Island City, MICHIGAN dealer, rates "tops" with McDonnell.

Martone Sewage Disposal Co., subcontractor at Levittown, has a MICHIGAN ⅜ yd. Truck Excavator. Mr. Martone states: "We can get it in and out of small places easily. It does a *lot* of work!" James Pepe, operator, volunteered: "I've run MICHIGANS for years. They're the easiest to operate."

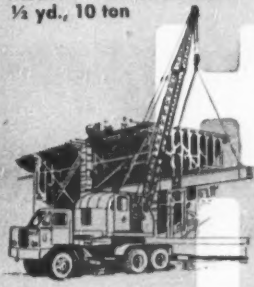
These opinions of MICHIGAN Excavator-Cranes are typical from profit-wise contractors. When you need an excavator-crane . . . investigate *MICHIGAN* . . . you'll agree it's *your best buy*. Write, wire or phone for details.

MICHIGAN POWER SHOVEL COMPANY

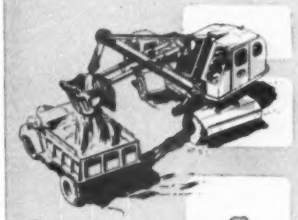
500 Second Street, Benton Harbor, Michigan, U. S. A.

Model T6K
⅜ yd., 6 ton

Model TMDT-16
½ yd., 10 ton



Model TLDT-20
12 ton



Series 8
½ yd., 8 ton

Model C-16
½ yd., 8 ton

How TIMKEN® bearings help a crusher crack down on cost-per-ton

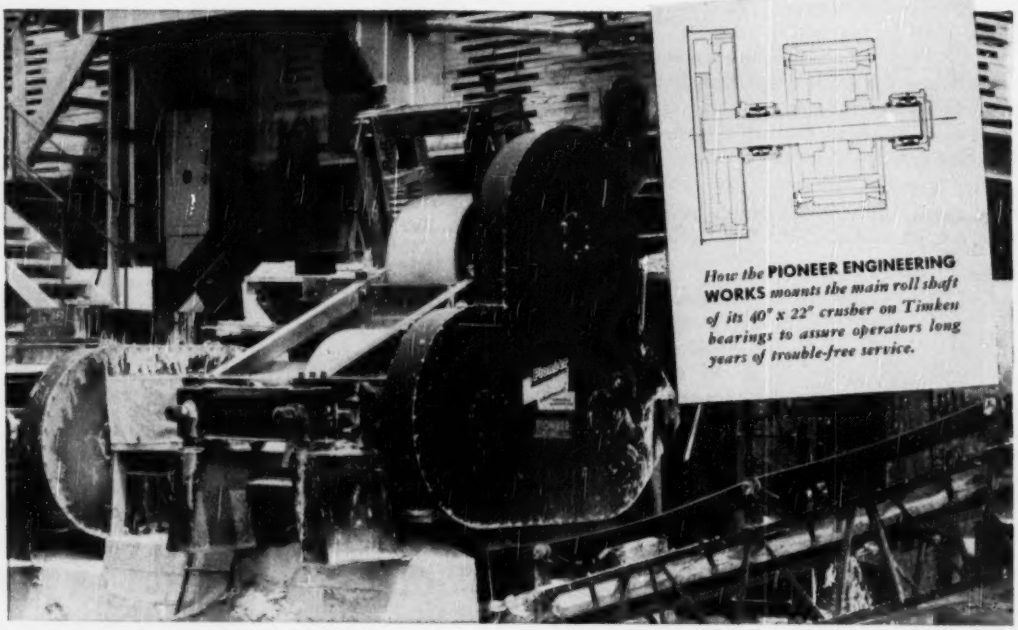
COST-PER-TON of material crushed hits a new low with this Pioneer Triple Roll Crusher on the job. It's been in continuous operation 12-hours a day since 1947, at the Francesville Stone Company, Francesville, Indiana. With the main roll shafts and countershafts mounted on Timken® tapered roller bearings, this 40" x 22" crusher can take heavy shock loads day after day without a stop, turn out a large volume of uniform aggregate. That's because Timken bearings insure long, trouble-free operation with minimum time-out for maintenance. Because of the excellent performance of the triple roll crusher, a new 40" x 22" Timken bearing equipped twin roll crusher recently was added to the plant to increase the output.

Tighter, lubricant-retaining closures are permitted, keeping out damaging grit and moisture. No complicated lubrication systems are necessary.

Timken bearings have exceptional stamina, are engineered for the job, and normally last the life of the machine. They are made of the finest steel ever developed for tapered roller bearings—Timken fine alloy steel. Tapered construction enables them to take radial and thrust loads in any combination. Line contact between the rollers and races provides extra load-carrying capacity. And because of true rolling motion and incredibly smooth surface finish, Timken bearings operate freely, frictionlessly.

It will pay you to make sure you have Timken tapered roller bearings in the equipment you build or buy. They're industry's No. 1 choice and are backed by 50 years of bearing research and development. Look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



How the **PIONEER ENGINEERING WORKS** *mounts the main roll shaft of its 40" x 22" crusher on Timken bearings to assure operators long years of trouble-free service.*

FINISHED TO CLOSER TOLERANCES

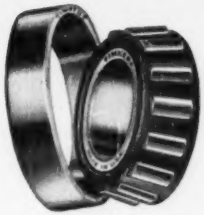
Finishing to incredible smoothness accounts for much of the precise, smooth rolling performance of Timken bearings. This honing operation is typical of the amazingly accurate manufacturing methods at Timken.

The Timken Company is the acknowledged leader in: 1. advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special analysis steels.

TIMKEN

TRADE-MARK REG. U.S. PAT. OFF.

TAPERED ROLLER BEARINGS



NOT JUST A BALL ○ NOT JUST A ROLLER ⊂⊃ THE TIMKEN TAPERED ROLLER ⊂⊃ BEARING TAKES RADIAL ◎ AND THRUST →◎← LOADS OR ANY COMBINATION ✳